

RECORD

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1880
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1883
1884
1885
1886
1887
1888
1889
1890

F. R. Fosberg

55

Collection and Field Note Book

No. 55

Sept. 14, 1959 - Oct. 25, 1959

(#40328 - #40722)

	<u>Pages</u>
TENNESSEE	
Ramsay Prong, E. fork Little Pigeon R.	1-2
Sig Locust Trail, near Chimneys Camp Ground	3
Great Smoky Mts. Nat. Park, Greenbrier Cove, - Ramsay Prong of Little Pigeon Creek, Sevier Co. 40328-40332	4-5
- Middle Prong of East Fork Little Pigeon Creek, Sevier Co. 40333	4-5
- Chimneys Camp Ground, West Fork, Little Pigeon River, Sevier Co. 40334-40337	4-7
Blue Ridge Parkway and Linville Falls area .	6-8
NORTH CAROLINA	
Linville Falls 40338-40345	8-9
Linville Falls, Parking Lot, Burke Co. 40345a-40347	10-11
Blue Ridge Parkway	10
VIRGINIA	
Shenandoah Nat. Park near Beagle Gap, on Skyline Drive 40348-40351a.	10, 12
MARYLAND	
Annapolis 40351-40352	12-13
west of Oakton (Don Stough's place and envi- rons)	14-15
D.C.	
Chain Bridge Flats, Potomac River 40353-40354	14-15

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Ramsay Prong, E. fork Little Pigeon R.....	1-2
Big Locust Trail, near Chimneys Camp Ground	3
Great Smoky Mts. Nat. Park, Greenbrier Cove, - Ramsay Prong of Little Pigeon Creek, Sevier Co. 40328-40332	4-5
- Middle Prong of East Fork Little Pigeon Creek, Sevier Co. 40333	4-5
- Chimneys Camp Ground, West Fork, Little Pigeon River, Sevier Co. 40334-40337	4-7
Blue Ridge Parkway and Linville Falls area .	6-8

NORTH CAROLINA

Linville Falls 40338-40345	8-9
Linville Falls, Parking Lot, Buroke Co..... 40345a-40347	10-11
Blue Ridge Parkway	10

VIRGINIA

Shenandoah Nat. Park near Beagle Gap, on Skyline Drive 40348-40351a.....	10, 12-13
---	-----------

MARYLAND

Annapolis 40351-40352	12-13
-----------------------------------	-------

west of Oakton (Don Stough's place and envi- rons)	14-15
---	-------

D.C.

Chain Bridge Flats, Potomac River 40353-40354	14-15
---	-------

F. R. Foster, Jr.

Pages

VIRGINIA

Fairfax Co., Sleepy Hollow .. 40355- 40359	16-17
--	-------

Air trip Washington, D.C. to Idlewild, L.I., N.Y.	16-17
---	-------

FRANCE

Flight N.Y. - Paris	18-19
---------------------------	-------

FRENCH WEST AFRICA

Flight from Bordeaux to Abijan via Bamako ..	20-21
--	-------

FRENCH SUDAN

Air trip	21-26
----------------	-------

IVORY COAST

Air trip	26-33
----------------	-------

FRENCH SUDAN

Bamako 40360	32-33
--------------------------	-------

IVORY COAST

Adiopodoumé, L'Anguédédou, Abidjan, Forêt de Banko..... 40361-40425 ..	34-57
---	-------

Banko National Park	58-62
---------------------------	-------

Region between Adiopodoumé and Banko	63
--	----

Savanna de Mousson back of Grand Bassam	64-73
--	-------

..... 40426-40464 ..	72-75
----------------------	-------

East of Port Bouet 40465-40469 ..	74-79
---	-------

Trip by road to north	80-81
-----------------------------	-------

Wine from Rerassus 40470-40478 ..	82-83
---	-------

Cote d'Amour	82-89
--------------------	-------

North of Dabou, s.e. of Nzi River, near	88-93
---	-------

Pakobo 40479-40507 ..	92-101
-----------------------------	--------

South of Lomo, east of Lomo . 40508-40526 ..	
--	--

Trip to Divo by car	
---------------------------	--

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2.

Collection and Field Note Book

No. 55 (cont'd)

IVORY COAST

Pages

Amatiore Forest Reserve	40527-40557	102-107
North Divo Forest Reserve	40558-40573	106-109
Swamp forest east of Agueby River	40574-40592	110-117
e. of Songon Agban	40593	116-117
Trip to Bandama Savanna	40594-40610	118-127
West of Dabou	40611	126-127
Banko Forest	128-130
Banko National Park	40612-40646	132-139
Trip by auto north from Abidjan to Yapo Forest and
Adiopodoumé	40647-40722	140-165
Notes made in the herbarium of ORSTOM, Adiopodoumé	166

* * *

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55

begin 40328

end 40722

Africa from p 20
to p. 166

114



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A BOORUM & PEASE PRODUCT

wine scrub
(Belcher)

1959

Tennessee

1

Sept. 14 Ramsey Prong,
E. fork Little Pigeon R.

Hypochilus thorellii, spider
that simulates a phalangid,
pretends to be dead when
molested, spin funnel-
shaped or campanulate
web under overhanging
rocks, over 5 cm. leg expanse.
one sp. in Appalachians,
others in E. Asia.

Virgin cove hardwood
forest -

- c *Halesia*
- c *Betula alleghaniensis*
- c *Acer nigrum* v. *glabrum*
- c *Acer rubrum*
- c *Tsuga canadensis*
- o *Magnolia acuminata*
- c *M. fraseri*
- c *Liriodendron tulipifera* 5' 5"
- o *Fagus grandifolia*
- o *Aesculus octandra*
- o *Lilium heterophyllum*
- o *Fraxinus americana*
- o *Prunus serotina*

Canopy 100' or more up, irregular,
tremendous trunks 3-5' dbh.
all sizes down. Spacing of
large trees very irregular.

~ *Aralia spinosa*
 ~ *Rhododendron maximum*
Ilex montana
Viburnum alnifolium
V. cassinoides ??
Kalmia latifolia

The general under-
 growth is *Rhododendron*.
 This is 2-5 m. tall, generally
 irregular but generally
 dense, some openings with
 ferns.

Mitchella is abundant
on ground.

Mosses and hepatics
 very abundant on trees,
 rocks and ground.

Sept. 14 - Big Locust Trail,
 near Chumneys Camp ground
 Trail leads through
 a fine patch of virgin
 forest -

Acer negundo var. *glabrum*
Fraxinus americana
Cladonia lutea
Liriodendron
Asculus ostandra
Robinia pseudacacia
Carya
Tilia heterophylla
Tsuga caroliniana (young)

shrub layer very sparse
~~*Ilex montana* ??~~ *Haleia* ?
 young *Fraxinus* & *Acer negundo*
 young *Tsuga* *Arnus alternifolia*
no *Rhododendron*

herb layer very rich -
Hepatica acutifolia (dominant)
Circaeifraga
Lupinus
Trachelium
Viola
Solidago caesia ??

special flora on rocks
Sedum ternatum
Polypodium, etc.

1959 Tennessee

Sedum and Cystopteris
on ~~the~~ mossy tree trunk
Sedum up to 2 m.
Cystopteris 1 m.

Greenbrier Cove,
Sept. 14 - Ramsay Prong of
Little Pigeon Creek, Sevier Co.
in virgin cove hardwood forest

- 40378 *Popularia*
occasional in canyon bottom
29 *Goodyera*
common on mossy rocks
and *Mitchella* mats
30 *Disporum*
rare along trail

- 31 *Fagus*
occasional
32 *Botrychium multifidum*?
common locally

- Sept. 14 - Middle Prong of
East Fork Little Pigeon Creek, Sevier Co.
33 *Passiflora lutea* var. *glabra*
rare in rich bottom-land
second growth hardwoods.

Sept. 14 - Chimneys Camp
ground, West Fork Little
Pigeon River, Sevier Co.

- 34 *Botrychium dissectum* f. *obliquum*
common locally in virgin
cove hardwoods forest

Great Smoky Mts. Nat. Park 45

tall, leaves
elliptic; sterile.
green with
of cream
from
at nerve
all pinkish white.
Tuberous.

medium sized tree,
sterile; bark ^{dark} gray

vine climbing 4 m.
in tree; leaves glaucous
beneath; sterile.

4 1959 Tennessee

See
on ~~the~~
led
Cigar

Fire in 1925

burned up

to parking

area at 30

Dome

Trails through

through burn

lots of burn

up a slight

looking south

from parking area

40378 Pyrus

1 29 Quercus

corn

1 30 Dispor

rare

1 31 Fagus

1 32 Botrychium multifidum?

common locally

Sept. 14

- Middle Prong of
East Fork Little Pigeon Creek, Sevier Co.

1 33 Passiflora lutea var. glabra

rare in rich bottom-land
second growth hardwoods.

Sept. 14 - Chimneys Camp
Ground, West Fork Little
Pigeon River, Sevier Co.

1 34 Botrychium dissectum

common locally in virgin
cove hardwoods forest

Great Smoky Mts. Nat. Park 45

shrub 3 m. tall, leaves
green, not yellowish; sterile.
leaves gray-green with
markings of cream
running in from
marginal nerve.
flowers pale pinkish white,
rootstock tuberous.
medium sized tree,
sterile; bark ^{dark} gray

vine climbing 4 m.
in tree; leaves glaucous
beneath; sterile.

1959 Tennessee

Sedum and Cystopteris
on ~~the~~ mossy tree trunk
Sedum up to 2 m.
Cystopteris 1 m.

Greenbrier Cove,
Sept. 14 - Ramsay Prong of
Little Pigeon Creek, Sevier Co.
in virgin cove hardwood forest

- 40378 *Pyrola*
occasional in canyon bottom
1 29 *Goodyera*
common on mossy rocks
and *Mitchella* mats
1 30 *Hesperis*
rare along trail

- 1 31 *Fagus*
occasional
1 32 *Botrychium multifidum*?
common locally

Sept. 14 - Middle Prong of
East Fork Little Pigeon Creek, Sevier Co.
1 33 *Passiflora lutea* var. *glabra*
rare in rich bottom-land
second growth hardwood.

Sept. 14 - Chimneys Camp
Ground, West Fork Little
Pigeon River, Sevier Co.
1 34 *Botrychium dissectum* f. *obliquum*
common locally in virgin
cove hardwoods forest

Great Smoky Mts. Nat. Rd 45

shrub 3 m. tall, leaves
green, not yellowish; sterile.
leaves gray-green with
markings of cream
running in from
marginal nerve.
flowers pale pinkish white.
rootstock tuberos.
medium sized tree
sterile; bark ^{dark} gray

wine climbing 4 m.
in tree; leaves glaucous
beneath; sterile.

40335

*Cystopteris fragilis*common in second-growth
(also in virgin cove hardwood forest)

36

Botrychium dissectum f. *obliquum*common in second-
growth *Rhododendron* forest.

37

*Hepatica acutiloba*very abundant, dominant
in ground cover

Sept. 15 - Blue Ridge Parkway
in the Mt. Mitchell area
between the Craggy Mts.
and some miles n.e. of Mt.
Mitchell. Pines are seen
along the parkway, reaching
down to an extreme low altitude
of about 4000', but quite
rare down so low. *Abies*
above 5000'. Beech gaps,
also, in this area above 4500'.

Linville Falls area -
open forest of mixed oaks,
some *Carya*. *Betula lenta*,
Fagus grandifolia, *Oxydendron*,
Pinus strobus, *Acer rubrum*,
Myrica asplatica.

leaves somewhat mottled.

Dense undergrowth 3-5 m.
high of *Rhododendron maximum*,
R. sp., *Kalmia*, *Kalmia*,
Clethra acuminata, *Fagus*
sprouts.

Almost no ground layer
except occasional *Galax*,
Mitchella, etc. a few ferns,
etc. Ground layer much
better developed in thin
places in shrub layer.

Down near stream *Taxus*
canadensis and *T. caroliniana*
occur. *T. caroliniana* has
habit of *Taxus* in the appearance
of branchlets, etc. and
much larger, looser cones.
Grows on bedded ~~granite~~?
Emin quartzite.

ledges at upper falls.
Does not have the drooping
tip of *T. canadensis*.

The quartzite is in places
almost soapstone-like in
appearance, greenish gray,
lustrous.

Xanthoxylum at foot of
cliffs. *Rhododendron*
minus and *maximum*
on cliffs.

Sept. 15 - Linville Falls
quartzite ledges around
below upper falls

- 140338 *Tsuga caroliniana*
common
39 *Tsuga caroliniana*
common

- 2 40 } *Rhododendron minus*
4 41 } common

- 4 42 *Xanthoxylum*
common at foot of cliff

- 1 43 *Helagrella nebulosa* sp.
in crevice in dry bed
of stream

- 1 44 *Asplenium*
rare in crevice of shaded rock

- 1 45 *Leucothoe*
rare in brush on cliff

On the southeast
slopes of Grandfather
Mt. along the part of
Rt. 221 connecting the
sections of the Blue Ridge
Parkway there are large
spruce trees scattered
in the forest for a
short distance, apparently
at an unusually low
altitude, but altitude
not noted.

Burke Co.

tree 12 m. tall, cones and
needles from under tree
small tree 5 m. tall,
8 cm. dbh., leaves not
in no place; cones from
beneath same tree.

shrub 2 m. long, pendent,
leaves coppery beneath,
shrub 0.6 m. tall, sap
bright yellow, flowers
cream white.

shrub 1.5 m. tall.

Sept. 15 Linville Falls
Parkway Lot, Burke Co. N.C.
40345a *Pyrola*
rare, edge of deciduous
woods, under *Acer rubrum*,
otherwise only *Carya* sp.
nearby.

46 *Coralorhiza odontorhiza*
along trail, oak-hickory woods

Sept. 15 - trail near
upper Linville Falls
47 *Tsuga canadensis*
occasional.

Sept. 16 - Blue Ridge Parkway
photographed corner Florida
at Tuggle Gap, *Phytolacca*
and *Rhus glabra* at m. p. 27.

Sept. 16 Shenandoah Nat. Park
near Beagle Gap, on Hightone
Drive. Weedy bank below
overlook. *Galium mollugo*
very abundant.
Checked weeds in list

shrub 1 m. tall; leaves
green, not yellowish;
fruit pale green.

Burke Co.

tree 25 m. tall, 4 dm. dbh.
cones and leaves picked
up under tree

Sept. 16 Skyline Drive just
east of Beagle Gap
on rocky embankment.
just below drive

40348

*Crataegus*49 *Crataegus*

50

grass

abundant, probably
planted to hold bank

51 *Vitis*

Sept. 17 - Annapolis, Md.

~~in~~ in meadow used as
playing field, unmowed for summer

51

Tridens flavus f. *flavus*

small colony with f. *cupreus*

52

Tridens flavus f. *cupreus*

abundant

shrub 2 m. tall, fruit
green.

shrub 1.5 m. tall,

fruit red.

caespitose, culms
ascending to erect.

woody vine

culms ascending,
spikelets pale greenish.
culms ascending,
spikelets deep purple.

Sept. 19 - 2 3/4 mi. w. of Oakton
(Don Stough's place and
environs)

Old pasture - open in
1951 - now covered by rather
thick growth of *Pinus*
virginiana 3-4 m. tall
with some juniper.

A sharply defined
swale running down
middle with no pine
but with several fair
sized trees - *Platanus*,
Robinia, *Pinodendron*,
up to 10 m. tall, with
considerable *Acer rubrum*
3-4 m. tall otherwise
Panicum clandestinum
1-1.5 m. plus *Eupatorium*
purpureum, *Solidago*, etc.
This usually wet.

Sept. 25 - Chain Bridge Flats,
Potomac River, D.C.

in open scrub on rocky
flat, covered in flood periods

403537
541
Quercus bicolor
Quercus bicolor

Wickham property -
a mosaic of patches of
Pinus virginiana, *P. rigida*,
hardwoods and 'hardwoods'
mixed with some pine
low hills, old
wooded over gullies,
flood plain of Difficult
Run and Little Fox Run,
old mill race, old
road traces, dam site?,
outcrops of Wissahickon
rocks, etc. Some wood
rather thin second
growth, some with
large trees: *Liquidambar*,
& *Thuja occidentalis*, *Fraxinus*,
etc. Wonderful sense
of successional
vegetation types.

Stream cut in about
5 m, with an occasional
hill higher than this.

small trees, 4 m tall.
shrub 7 m. tall.

Sept. 24 - Sleepy Hollow

- 40355 *Cucumis sativa*
planted in garden
- 56 *Polygonum*
common weed in garden
- 57 *Mollugo verticillata*
occasional weed in garden
- 58 *Galinsoga*
common weed in garden
- 59 *Aster macrophyllus*
common in wooded
area around dwelling

Oct. 5 - Air trip, Washington
to New York, L.I. N.Y.
afternoon, hazy.
Turned south of Baltimore
and flew east across
Eastern Shore.

Long sinuous stringers
of tidal marsh run well
in from both sides
into the predominantly
cultivated land. On
the ocean side about
at mouth of ~~Delaware~~
narrow part of Delaware

wine climbing 3 m. in
tree.
flowers dull rose pink

prostrate, flowers
pale greenish.
ascending; rays white
disk dull greenish.
spreading by extensive
system of running
rootstocks; rays white,
disk yellow. (Brought
in from mountains
a few years ago and
planted, has since
become very abundant
locally.)

Bay, on both sides ^{of it} are
large areas of tidal
marsh and tidal
channels. Some very
large creeks or rivers
(Custharts) especially
on New Jersey side.

Pine barrens appear to be
open forest with closed
shrub or herb layers, when
viewed from air. Some areas
with closed or almost closed
canopy. More closed toward
northeast whereas more
extensive areas.

Oct. 6 - flight N.Y. - Paris.
Brittany coast near
Cherbourg - an almost
completely cultivated
landscape, dull straw-
brown, incredibly cut up
into rectangular plots
by hedges. A very few small
forested areas.

Encountered a south
trending coast first - crossed
a peninsula, then an
eastward or sl. s.e. trending
coast with a belt of dunes,
leading to a large river
mouth, several tiny inlets,
coast trending about
east but obscured by clouds.

Coast continues east,
sandy, dissection of land
by hedges becomes less, & a
river mouth and delta.
Coast turns a bit north of
east. Where ^{the coast crosses} ~~the coast~~ ^{the land} is dissected
by hedges but not so
finely as where we first
reached land. ~~Some of the~~
home orchards. A few
small forests. Visibility poor.
This pattern continues for
a large part of the way to
Paris, then changes to
large expanses of fields without
hedges. ~~Paris.~~

Fontainebleau Forest
is very dry - many
small trees have all
their leaves dead. There
has been no rain since
August and only one
rain since May.

The large area of
Calluna and Betula
was burned over
2 weeks ago. The Calluna
burned off at ground
level, except a few
spots isolated by
bare rock and sand.
There were affected some
but not burned. Tips
dry. Birches killed
even where no Calluna
immediately beneath
them. Pines around
edges partly dead
to 30 hectares burned.
but fire did not
get into dense part
of pine forest.

The forest generally
seems to have more
undergrowth than I
remember, possibly
due to reduction of rabbit
population by myxomatosis.
Pteridium abundant
but partly dry.

1x3

Oct. 7 - flight from Bordeaux to
Abijan via Bamako

Mostly at night. 1/2 hour
n. of Bamako almost entirely
cloudy. occasional glimpses
seem to show desert with
no trees. 10 minutes before
Bamako clear but very
hazy. Scattered trees
with sparse irregular
herbaceous (?) vegetation,
patches of red soil.

Vegetation becomes
denser approaching
Bamako. Surrounding
the city but away from
the Niger is disturbed
savanna, cultivated
in places, bare eroded
soil in places. The
broad ravine (2-3 miles
wide, at least) of the Niger
is green. Patches of
thin forest. Mostly culti-
vated patches, very
clearly in tilled up rows,
but not obvious what
the crop is. Some grass.

Bamako is a fairly
large city. A large Cassia
seems to be the principal tree,
at least near the air strip,
which is in the edge of the
city. Several grasses are

abundant, especially
what seems to be a Penni-
setum about 1 m. tall, an
Andropogon about the
same height and a Themeda (?)
about 2-2.5 m.

The ravine is cut into
flat sedimentary beds
which form several
series of cliffs and ledges
on the sides.

The Niger here is already
a broad river. The flood
plain is wide, densely
populated, partly culti-
vated, partly in orchards,
partly grassy savanna,
quite green at this season.

Left Bamako at 9.27. Left
side of plain, flying a little
east of south. 17000'

Here is savanna, with
trees irregularly, mostly
rather closely spaced.
Some areas are green, others
brown, the pattern seeming
to correspond partly to
patches of sand, partly
to wide evaporation basins.
Brown area generally
outlined by denser vegetation.
Soil seems generally
rather reddish where
exposed by overgrazing.

However, occasionally there are angular fenced fields with scattered trees that seem pale and sandy. Heathered villages have trail radiating from them.

Small watercourses have water in them to be seen when the sun is right. These not especially close together. Small dams and ponds at villages.

9:42 Trees sparser and especially smaller. Drainage changes from north to south, and small streams become more closely spaced. Meandering apparent but not marked.

9:41 Some flooded meadows, but few. Drainage now to east.

Reddish areas more common, outlined by scrub and including small patches of scrub. Appear to be areas that are seasonally flooded but dry now. This not very clear. Possibly trampled by cattle.

9:45 These areas now appear to be partly grassy and certainly to correspond to drying basins or pans. The country is very flat and although there are a

few streams, a network of these pans replaces them in the interfluves. Considerable water and some flooded areas along streams.

9:43 That along streams greener. No gallery forests, but thickly scattered trees and shrubs generally except in the irregular patches or drying pans mentioned above and in the green marshy areas along some streams.

9:50 Slight gallery scrub along streams now.

9:52 Drainage eastward to a large meandering stream or small river which crosses course and then turns north.

Large meanders, very narrow strips of scrub or trees lining banks. Water somewhat muddy. Its affluents very slightly incised and with very narrow strings of gallery scrub, in parts the banks are lower and marshy. Villages widely spaced and surrounded by angular patches that may be cultivated but not clearly so.

The clearly marked watercourses all have considerable water at this season but clearly marked marshy (?) ones drain into them that may be dry. As we get farther from the large stream the gallery scrub becomes thinner and more infrequent, though streams are ~~also~~ fairly closely spaced. The savanna tends more toward grass, but trees are still generally present. Occasional small patches of woods, but tiny and infrequent. Angular cultivated (?) patches common, occupying perhaps 5-10% of area, locally less. Houses common but mostly not aggregated in villages but singly or in small groups in fields. Marshy and flooded areas along large streams even where there is narrow gallery scrub. "Drying pans" have ~~been~~ ^{been} ~~found~~ but there are some meadows without trees that may be the same thing but less bare.

10:05

A large stream in distance

4 left, apparently flowing north or northward.

Very little gallery scrub along streams draining into it and this interrupted.

Perhaps the angular bare patches are corals rather than cultivation??

10:07

Small streams draining eastward to large stream are now more strongly but closely meandering. More gallery scrub.

Tiny flood plains seem to be marshy or meadow. Main stream much closer now. Meandering with considerable flooded land on flood plain. The flood plain generally treeless except for very narrow gallery scrub probably on narrow natural levees.

Savanna on interfluvials here much more closely wooded, in place would be called open forest or even closed forest.

10:13

Here crossed the most marked tributary of this stream - it has fanned out into a dendritic pattern of headwater streams.

Another much larger

1497 French Sudan
Ivory Coast?

stream now visible
in distance is left.
running northeast
with much flooded
land on flood plain.

10:15

A scattering of rather
abrupt hills or buttes,
possibly granite domes,
their tops rather flattened
and open their slopes
wooded. Several villages
in this vicinity. Streams
rather closely spaced,
with narrow gallery
scrub, green marshy
areas. Country generally
dull green, some patches
of open forest, some almost
treeless. latter roughly
angular, doubtless due to
man's activity.

10:20

10:20
10:25
10:30

The large stream closer
now. More hills, now
somewhat elongate and
in two interrupted ranges,
one on each side of stream,
parallel with it, but
some distance away from
it. The hills with open
forest, not so abrupt as
those first noted.

10:31

Stream looks westward
and northward across
cove. Large dark colored

French Sudan
Ivory Coast

areas, partly still flooded,
on the flood plain. So
recently desiccated that
no grass has grown yet.
Narrow gallery scrub
along channels. These
somewhat braided.

Its southward tributaries
small but closely
meandering in narrow
flood-plain. These grassy
but not now inundated.
Very narrow but definite
gallery scrub. Many
indefinite, marshy or
smaller, affluents of these
do not have any gallery
scrub.

10:27

Country generally somewhat
greener. Patches of woods
more common but still rare.
Some open forest, some
meadow, mostly savanna.
Streams rather frequent.
Bare rather purplish, angular,
cultivated (?) patches common,
also various stages of regrowth.

10:31

Here the stream drainage
has changed from being
randomly dendritic to a
peculiar sort of rectangular
dendritic pattern, with
most closely spaced streams
running S.W. or N.E., roughly

1957 ~~French Sudan~~ Ivory Coast?

and the main one running
e. s. to a larger one that
runs n. e. Gallery
forest much more developed
here, and heads of small
streams usually in a
somewhat wide gallery
patch.

10:34

This pattern quite marked
here in headwaters of
the larger stream. Interfluvies
too, have patches of dense
woods or open forest, separated
from gallery forest by
almost treeless strips of grass.

10:36

The rounded patches become
more marked and more
extensive; the grass less
so. Perhaps 50% of area
densely wooded, 20% sparsely
so, 30% grass and savanna.

10:38

Larger, eastward flowing
very much meandering river
visible ahead. Drainage
now toward it. intricate
system, and distribution
of forest, savanna and
grass now intricate, too.
Less open forest, more
abrupt boundaries between
forest and savanna or grass
(mostly closed forest and
savanna).

10:42

Closer to river grass becomes

more abundant. (course
turned somewhat to westward
along this river, apparently
to avoid bad weather). This
river closely meandering
over a wide flood plain,
generally over its banks
here turning southward
(upstream). Its channel

10:44

interrupted somewhat
southward by rapids
southeast of this part
of stream forest and
grass form a series of
conspicuous parallel
strips, parallel to the
river, apparently repre-
senting an exaggeration
of the rectangular pattern
noted above, with stream
lined with grass, no
gallery forest, and interfluvies
forested. This not so
marked on west side
of river, where the pattern
includes gallery forest, and
is not as close or so parallel.

10:47

Stream swings west
again? Thick clouds
from here, no visibility.
Holes in clouds show a grass
with very well
developed dendritic networks
of gallery forest - some scrub

10:57

- and scattered trees in the grassy interfluvies. general color bright light green. Soil in a few clearings rather red. Some small villages. Gallery forest less marked, pattern more vague. Human activity increasing. Drainage network finer.
- 11:50 Complete cloud cover again.
- 11:51 Very poor visibility through clouds shows savanna but no details.
- 11:55 More visibility - This seems to be ~~rather~~ densely forested land but with much clearing, some fairly large savanna patches, some villages. Visibility still poor. Broken clouds.
- 11:57 Much clearing, more frequent villages, no savanna except obvious results of shifting agriculture. Some good areas of forest.
- 11:59 Small town on railroad. Mosaic of forest and clearing. Forest was abundant farther from railroad. Clearings bright green.
- 11:59 Some paralleling and to right of railroad. Typical shifting agriculture landscape

- but with many tiny villages or permanent farm sites.
- 11:52 Mosaic of small clearing and small patches of rather degraded forest. Low visibility.
- 11:53 Some plantations, a small town to left.
- 11:54 Roads, clearings, villages fairly common. Shifting agriculture, small plantations. Forest somewhat more abundant but degraded. Banana patches. Much shifting agriculture.
- 11:55 Fairly continuous and much better forest, apparently a reserve.
- 11:56 A railroad and a road. Then shifting agriculture, some fair patches of forest.
- 11:59 A town and plantations, some forest.
- 11:59 Descending, ascending. Some hilly country, well forested, to east.
- 11:59 Lagoon ahead to left. Rather open forest of big trees. Plantations.
- 11:59 Intricate lagoon pattern. Shifting agriculture. Lagoons muddy. Islands mostly cleared. Many palms. Some grass. White sand.

Oct 7 - Abidjan -
Street trees

Terminalia catappa

Cassia siamea

Delonix regia

Cecropia peltata

Cordia alliodora

Casearia madagascariensis

Gliricidia sepium

Bauhinia variegata

Mangifera indica

Cocos nucifera

Cultivated plants
Antigonon leptopus

90360 Oct. 7 - Banako, French Sudan
Pennisetum
dominant grass in
waste ground around
airport.

up to 1 m. tall; spikelets
pinkish to deep rose.

Oct. 7 - ~~Atropodoumi~~ *Atropodoumi*
 Planted species
Clusia guineensis
Mangifera indica
Hippocrepis pumila ?
Bongavillea spectabilis ?
Hibiscus ornamental hybrid
Hevea brasiliensis
Chrysolidocarpus lutescens
Neptrolepis biserrata
Euphorbia pulcherrima
Kalsendro pinnata
Passiflora chinensis
Ravenala madagascariensis
Athernanthus versicolor
Gynura
Enceltharctos barteni (ghana)
Thunbergia erecta
Cordia terminalis
Thunbergia grandiflora
Cyrtosperma robusta
Aletris
St. Mesquite nivalis
Cordia alliodora variegata
Spathodea campanulata
Boerhaavia alba
Terminalia catappa
Canarium schweinfurthii
Acalypha wilkesiana
Chenopodium rubrum
Cocos nucifera
Acalypha hispida
Bambusa arundinacea
Citrus maxima

Artocarpus altilis
Euphorbia
Chrysolidocarpus lutescens
Agave
Manihot esculenta
Antigonon leptopus
Tournefortia

Oct. 7 ^{P'Anquedou}
~~L'Anquedou~~
 Roubé, E. G. P. Sta.

In edge of secondary
 thickets

4036

Labiacea

occasional

2 62 (rub.)

rare

3 63 (mucos.)

rare

1 64 Phyllanthus

common

2 65 Rhabdopetalum

~~not~~ common

2 66 Dactyloctenium

rare

2 67 Chasalia

occasional

1 68 (apoc.)

common

2 69 (Euphorb.)

common

1 70 Scytotopetalum

occasional

1 71 Mussaenda

~~not~~ occasional

71a (Rubi.)

occasional

45 m. (alt.)

twiner, flowers white.

shrub 2 m. tall; flowers
 white, very fragrant.
 vine, hairs on fruits
 vermillion.

scandent shrub,
 fruit green.

small tree, branches
 elongate, drooping;
 petals rose pink,
 very fragrant; fruit immature.
 scandent shrub; leaves
 pale beneath; flowers
 white.

shrub 2 m. tall;
 thyrse and corollas white.
 vine, corollas bronze,
 turning brown.
 scandent shrub;
 flowers yellowish; ripe
 fruit red.
 vine, sterile.

shrub 2 m. tall; enlarged
 calyx lobe white, corolla
 yellow.
 vine, sterile

Oct. 7 - between Abidjan
and Adiopodoume

403718 *Carinata*

common in old plantation
island

Oct. 7 - between airport
and Abidjan

on flat open white

silica sand with scattered bushes.

72 *Mitracarpum*
common

73 (det.)
common

74 *Emilia sonchifolia*
occasional

75 *Hedyotis*
common

76 *Borreria*
common

77 (apoc.)
common

These sands appear to be
podsolized - at least they are
washed very pale. The texture
is fine but has a consider-
able amount of coarse grains.
Vegetation an open scrub, largely
dominated by *Clerodendrum* sp.
with scarlet flowers.

30 m (det.)

peduncle erect; corolla
white; fruit fleshy, dark blue.

2 m.

flowers white

stems spreading,
somewhat ascending,
corollas pink.

flowers pinkish-purple.

stems spreading.

flowers white.

flowers yellowish,
plant scandent.

Langue Dedon - this is
a plantation area, cleared
from forest less than 15 years
ago. Some of the area is in
secondary thicket about
3 m. tall, extremely dense
and tangled with vines.
A species of rattan is common.
An enormous *Leiba welwitschii*
has been left. (photos)

Oct 7 - Adzopodoune
forest beyond botanical
garden. (Bordachonnes)

Secondary forest.

Aspect on steep bank
above lagoon - Open
stand of medium trees
15-30 m tall, crowns mostly
separated. Dense shrub
layer 3-4 m high growing
mainly in clumps of
several stems from base
but tangled above.
Many of the shrubs
scandent, some
really vine-like and
turners stems above
ground 1-2 cm thick.

Vines and shrubs form a
tangle that requires a machete
to penetrate.

At the water's edge the
trees tend to have stilt roots
and to grow out horizontally
over the water.

The soil is a yellow brown to red
brown fine sand, becoming redder
and with a little clay downward.
No concretions.

(10m) On low flat dry ground
scattered very large
trees, up to 50-40 m. some
with buttressed trunks.
also scattered medium
trees. Trunks covered
by aroids (Pulcinella?)

0-15m
A layer 4-5 m or more
tall of large shrubs,
stems to 4 cm or more thick.
Tops arching, scandent,
tangled, but spaced
1-3 m apart so that
walking is easy except
for tangles of elastic
vines, some probably
Almost no herb layer
except for a scattering
of a small aroid and
of Carinta sp. this rare
except near margins.
Shrubs single-stemmed
or clumped.

Very little sun penetrates
this ^{lower} canopy.

Swamp - water cut on or on surface of ground. Small trees, to 15 m. Tall, of several kinds, but all with well developed stilt root systems, the tops of these 2-3 m. high, mostly wide, arching. Leaves mostly large 2-3 dm. by 1.5-2 dm. Canopy almost closed.

A rather thin shrub layer 1-2.5 m. high.

Possible to walk without too much difficulty on root mat but not in a straight line because of stilt root clumps.

Orchids abundant. Trunk epiphytes rare except for a few lichens and bryophytes. There also on stilt roots.

Mud or peat rather liquid but filled with wood.

Most common trees *Quapaca* (stilt roots) & *Mitragyna*.

somewhat loses its character. The two most marked layers become diffuse and less well marked, few or no very large emergents, but *Eleis* common, very tall emergent. In some places the shrub layer is lacking, replaced by a large *Marantaceae*.

Forest on top of flat-topped ridge 30-35 m.

Scattered large trees up to, perhaps, 25 m. or 30 m. tall, trunks to 6-8 dm. thick, some buttressed, some stilt roots. Lower trees, perhaps 15 m. forming in places a canopy, in others more irregular and open. These 11-2 dm. thick or less.

A dense shrub layer 2-4 m. high, of slender erect stems 1-3 cm. thick, spreading crown, becoming scandent, tangled with vines. Difficult to walk through but not impenetrable, occasionally making dense tangles, not biting.

Ground mostly bare except for scattered small seedlings and occasional mats of *Carinta*.

dry leaves thick on ground, soil brown, loamy.

Back toward the road the ridge widens to a plateau and the forest

Oct. 8 - Adiopodoumé, 17 km. N. of Abidjan
in forest reserve

40378 (lit.)

roadside in swamp

1 79 *Mucuna flagellipes* Vogl.
common in edge of swamp

1 80 (Marant.)
very common in edges of swamp

1 81 (Marant.)
rare, roadside in forest

6 82 *Carinata*
very common in edges of ~~low forest~~ forest on low ground

4 83 (rub.)
common in scrubby undergrowth in secondary forest, banks of lagoon.

7 84 (tit.)
common in scrubby undergrowth in secondary forest

1 85 (moss)
on earth bank along road in forest

same - in degraded forest on flat well drained ridge top

86 (moss) *Anchomanes difforme* Eng.
common

1 m. flowers greenish

0.7 m. large liana, climbing in trees; flowers cream color, changing to purplish gray, pendent on long cord-like peduncle, peduncle erect; fruit red, fleshy.

1 m. fruit triangular in cross section, red, fleshy.

2 m. prostrate, trailing, flowering and fruiting stems erect; leaves paler beneath; corolla white; ripe fruit dark blue.

1 m. scandent shrub; hairs reddish; fruit fleshy, yellow when ripe.

1 m. subscandent shrub, flowers straw color.

4 m. gray-green

7.5 m. ~~sterile~~ petiole brownish green; sterile

- 40387 *Psychotria*
common in undergrowth
- 8 88 *Palisota hirsuta* K. Schum.
common along trail and road
- 4 89 *Xylocarpus*?
occasional in undergrowth
- 4 90 ~~*Stemodia*~~ *Cola*
common in undergrowth
- 2 91 (lichen)
on leaves in undergrowth
- 2 92 ~~*Stemodia*~~ *Cola*
common in undergrowth
- 1 93 *Heisteria*
common in undergrowth
- 2 94 *Burfordia imperforata* C.B. Cl.
common along trails and roads
- 2 95 ^{open} same - *Sporobolus* on steep slope
~~*Sporobolus*~~ *Sporobolus*
- 3 96 *Hedyotis*
common in mud near lagoon
margin in botanical garden

- 35 m
↓
shrub, stems green,
thyrse purple, flowers
dull purplish, tube curved ^{fruit}
suffrutescent herb to 1 m.
2 m. tall. inflorescence
branches erect, buds
white with dark purple
tips
scandent shrub; fruit
immature.
small tree 5 m. tall, flowers
on short inflorescences
on last year's growth,
and longer one ~~at~~ near
base of trunk.
- shrub 2 m tall fruit
white-tomentose
scandent shrub.
calyx white when young,
rose when mature,
fruit white, fleshy.
- 25 m
prostrate, forming
loose mat; fruit white
but juice stains paper
deep purple.
- 1 m.
prostrate, somewhat fleshy,
flowers white, fruit green.

Oct. 9 Fret de Bambro

Upper layer open
trees 30 m. tall or more.
Lower layer 10-15 m. tall
or less closed.

A dense lower layer
3-6 m.

Very little on ground.

Upper layer locally
closed, but *Pernambuco* species
Here the second layer is very
poorly developed. Vines
abundant.

Cereus - common.
Argemone - rare. Trilled low.
Some of large trees buttressed.

The lower layer
varies in height from
place to place, from
3-4 m. to 10-15 m. Where
taller it is fairly open
below.

Primary forest in fairly
undisturbed condition.

Scattered enormous trees
Alstonia, *Lophira*, *Cassia*
etc. perhaps 40 m. tall.
a canopy of medium trees
perhaps 20 m. neither
of these layers completely
closed, the lower almost
so in places.

A lower layer 3-6 m.
almost closed.

Good ground cover of
seedlings, some herbs,
ferns, etc.

Soil quite loamy,
dark gray-brown, almost
no litter.

Some large lianas
but not an excessive
number.

Araceae climbing
tree trunks. *Lomariopsis*
thin covering of *Epiphyllum*
Cratogeomys.

Some of large trees
buttressed, others not.

As Prof. Mangenot this has
been altered somewhat by
man, the most useful species
have been removed, not enough
large trees but no secondary species
present.

Ivory Coast

This is even now a widespread condition in Ivory Coast, perhaps 1500 ft. or less.

Another ~~place~~ place, the upper layer is more complete, the second layer almost lacking or at least thin, the shrub layer much thinner but very definite.

Locally the second layer is fairly complete. In such places the shrub layer is very sparse.

Ground layer of seedlings fairly sparse.

Forest on fairly flat ground has an almost complete canopy at about 30 m. rather dense ~~no~~ shrub layer 2-5 m. high abundant lianas. Many of large trees buttressed.

L. Hall

Swamp with enormous Parkia Nitragyna, rather irregular, a low canopy at about 10-15 m. thin undergrowth. Lianas abundant, some very large. Restricted area.

Surrounding forest thickly draped with lianas. This appears rather disturbed.

Nearby swampy ground lacks big trees but has a dense canopy at about 20-25 m.

Oct. 9 - Adzopodoumé, ¹⁵ 17 km
along trail in secondary
forest on red sandy soil

40397

Hedyotis

common locally

3 98

Hedyotis?

common

5 99

Hedyotis

common

40400

Sabicea

common

2 01

Carpolobia gracifolia Stapf
occasional

1 02

Musanga smithii R.Br.
commonsame - in swamp
forest

1 03

Macaranga standtii Pax?
common

1 04

Mitragyna stipulacea
common

3 05

common

same - around old dwelling
planted

3 06

Artocarpus altilis
planted

w. of Abidjan

25 m

stems ascending; ~~flowers~~
white.

stems decumbent;

corollas white

prostrate, corollas
bluish-purple, stigma
white. (flowers 3 or 4 mm)prostrate; corolla white;
fruit fleshy, white outside,
dark red within.shrub 1 m. tall; flowers
white.

5 m.

tree 15 m. tall; flowers,
stipules and leaves
from ground beneath tree.

0 m.

tall tree with conspicuous
stilt roots.large tree, specimen
from sprout.large liana, leaves
scarce on lower parts,
tips long, whip-like,
leafless; flowers on
branchlets on lower
parts, near ground,
yellowish green.

20 m.

tree 15 m. tall, sterile, very
lactiferous.

Oct. 9 - Banks National Park
in tall rain forest

- 240407 *Marattia pasinea*
abundant on road cut
4 08 (*var.*) *Anchomanes difformis* Engl.
common in clearing

- 1 09 *Thouningia sanguinea* Vahl
rare
2 10 *Macaranga triloba*
common in edges along
road
6 11 *Carintha*
abundant, especially
along roads
4 12 *Eupatorium guadalupensis*
common along roadside
2 13 *Diplostephium* ~~*hirsutum*~~
~~*hirsutum*~~ *chevalieri* (Brenck.)
common along roadside
4 14 *Hedyotis chevalieri* (Brenck.)
common locally along roadside
2 15 *Centotheca lappacea*
common along roadside
2 16 *Pteris*
local in dense part of

5-7 km. n.w. Abidjan

50 km



erect, petiole and peduncles
dull gray-green, mottled
with paler; leaf
palmately compound;
spathe erect, ill-scented,
with many maggots
in lower part. peduncles
gray-green, spathe
bronz outside, light
green inside, pistillate
flowers black, staminate
white.

bracts pink

liana; sterile.

prostrate, scapes
erect; flowers white,
fruit scarlet.

much-branched
herb. to 0.8 m. tall; heads
lavender.

erect herbs from horizontal
rhizome; corolla white.
erect.

dark green

40417

- 1 ~~common~~ in undergrowth
 3 18 *Randia "acuminata"*
 in undergrowth
 2 19 *Psychotria*
 occasional in forest floor
 2 20 *Begonia quadriala*
 common on cut bank of road
 1 21 *Aframomum*
 in edge of forest along road
 1 22 *Endosiphon*
 very common along road
 4 23 *Carinata hirsuta*
 common locally along road
 4 24 *Hedyotis chevalieri*
 common locally along road
 1 25 *Cola*
 in dense forest

slender shrub, flowers
 greenish white.
 shrub 1.5' m. tall.

leaves dark green, pale
 beneath, flowers white.
 leaves indurcent, purplish;
 flowers orange. Leaves
 appressed to bank.
 stem erect; flowers
 yellow.

flower blue-violet,
 tube ~~curved~~ doubly
 curved, white.
 prostrate; fruits
 very soft, fleshy, appearing
 inflated, ~~translucent~~ bright
 orange.

erect from prostrate
 rhizome, flowers white.
 shrub, flowers deep
 orange within, lobes paler.

Oct. 10 - Banks National Park
Tower set up in rain forest -
45 m. high.

Second platform, 23 m. in the canopy. Tower is between two enormous emergent trees. Unfortunately a nearby tree had its crown broken off, so one side of the tower is in a hole in the canopy.

Almost no epiphytes at this level.

Between here and the top (45 m) a few clumps of *Rhipsalis* and a leathery *Polypodium* with elongate rhizome and dimorphic entire fronds the sterile 2-4 cm the fertile 7-8 cm long. A nearby tree has fairly prominent

The two trees, *Liptadenia* and *Combretum* (a *Combretodendron*) have rather stiff leaves & leaflets.

The greater part of the trees and vines forming the surface of the canopy have fairly small leaves, very few are 15 cm long (1.5 m) perhaps 30% more microphylls. Canopy trees tend to be flat topped.

One tree, at a little distance has great festoons of epiphytes on its primary

branches.

This is an uneven canopy, with rather few trees that would be called ~~top~~ emergent but with very much "relief" perhaps 15 m. or more on the top surface.

Rhizomes are abundant in the surface layers of this canopy.

Many of the vines and trees flowering or in bud.

All small flowers.

General tone dull dark green but many trees now showing flushes of young growth. Bright green, tawny, or reddish. Flowering also contributes touches of yellow or yellow-green, or brownish, and red.

No bare trees at all seen. (Caught on very slender emergent that is probably dead.)

Individual trees very much in the amount of festooning by vines. In places the interior of the canopy is very densely tangled with vines.

Some trees are almost covered on the outside. Others not at all or scarcely.

In upper branches cruetor

Lichens are abundant, a few small mosses. Mosses become more luxuriant downward in the canopy, the crustose lichens appreciably less so.

Proportion of large leaves increases downward in the canopy, and that of microphylls rapidly decreases to almost 0.

Pinus in canopy with large white flowers with very narrow petals.

Many species fruiting, also

On the ground, the forest is rather open - the shrub layer, 2-4 m. tall, is of slender erect shrubs, spaced 1-2 m., not at all tangled, crowns not touching.

Layer 10-20 m. not very definite but present

On ground is a layer of seedlings about 2-3 dm. tall covering perhaps half the ground. Some *Pinus* but here sparse, most forming a dense mat as on roadside. A few ferns.

Soil a chocolate brown fine loamy sand. Much cultivated by large earthworms and

ants

A few small rattans seedling layer very variable in density, in places almost lacking. *Bromelads* here to 10-15 dm diam. mostly somewhat buttressed. Large trees spaced 6-11 m.

Large leafed aroid vines or lower parts of trunks common but not abundant.

Leaf epiphytes uncommon. Only a thin layer of mosses on trunks.

Large lianas common but scarcely forming tangles. Walking perfectly free.

Cover by upper 3 layers together essentially complete.

A few fallen logs, but only large ones still have their shape, the small ones flattened. Decomposition very rapid.

On top of ridge the large trees are only about 15-20 m tall. Canopy almost closed but not quite tangled shrub layer about 3-4 m. but possible to walk thru it. Ground layer about as dense below. Layers between very indefinite.

Trees at least 2 m diam. This perhaps an emergent 30 m. or perhaps but 25 or 30 m. tall.

The region between Adopodoume and Bambo is a mosaic of cultivation and secondary thicket. In most of the cultivated area and thicket scattered tall trees remain from the forest, the densities varying from 0 to almost closed forest. The latter either left accidentally or for shade for cacao and cola. The coffee here does not need shade. The patches are mostly small. They may be of coffee, bananas, cacao, cola, or especially, manihot. A few patches of pineapples. There are some bananas without trees. Truck gardens in wet flood plain land near lagoon. Elaeis very common locally forming the most conspicuous part of the vegetation.

short 10
p9

Oct. 10. Savanna de Mousson
back of Grand Bassam
broad strip of grass
about 1-1.5 m. tall, mostly
an *Andropogon*, *Anadelphis* with
with some admixture
of smaller ^{*Panicum*} grasses and
an *ericaulad*.

patches of dense shrub ^{10m tall}
Melastoma, *Stipularia*
aficana, etc. occasional
taller shrubs very rarely
small trees.

Black wet soil - said
to be wet 7 months of year.
becomes paler brownish gray
gradually, beginning about
10 cm. Water table perhaps
2-3 dm.

Laudetia phragmitoides
Anthroclista vogelii
Raphia gigantea

Slightly higher drier
spots have lower sparse
vegetation, very little
humus accumulation *Idesia*
Lycopodium, *Xyris*, *Eriocaul.* etc.

patches of low irregular
wood are inundated,
even more than most of
the grass.

Toward the sea is a very
low broad ridge of white sand,

with open scrub,
sparse herb vegetation
between shrubs - low
Rubiaceae, etc. tall ~~etc~~
clumps of *Eragrostis* ~~linearis~~.

The low woods in the
savanna are largely
of *Chrysobalanus*, with
Mitragyna, *Anthroclista*,
Raphia, and a number
of other shrubs and
low trees. *Raphia* grows
to 20 m. (trunk) 20 m. lvs.
trunks largely covered by
a tangle of broad
sheath fibers, these
perhaps 5-8 mm. wide,
2 mm. thick, stiff, curved.

The savanna is brown
by burned - patches show
it. Said to be burned
over every January.

Small area of *Imperata*
cylindrica. Some areas
mainly sedges. The
Anadelphis prairie is
the most extensive aspect,
with or without the
scattered low patches
of shrubs.

Oct 10th s.s. of Port BouetFlat of quartz sand just
back of beach sand reddish, coarse.Covered by a mat of *Iporroa*
pacifera, *Boerhaavia*, *Erulia*
serotifolia, *Cassytha*. Large
patches of *Sarcocornia longiflora*.*Euphorbia* on loose sand
exactly the habit and
appearance of *E. speciosa* of
New Jersey white sand.From Port Bouet to Grand
Bassam is mostly
coconut plantation
of various heights and
ages and conditions.
Some very clear, some
clipped with brush.
A few areas without
coconuts, irregular
scrub 1-3 m. tall, mostly
closed, on sand. Toward
Grand Bassam some areas
with scattered *Clusia*.Oct. 10 - Mousson savanna.
back of Grand Bassam
in dense grassland
on wet black humic sandy soil.
Cyrtosperma senegalensis
occasional

40426

1

s.s. of Abidjan

1 m.

↓

scapes erect, bronze
green without, cream
and purple striped within,
spadix dark brown.

- 40427 (circul.) *Mesanthemum radicans* Koen.
common
- 28 *Stipularia africana* Beauv.
common, forming small
low patches
- 29 *Panicum parvifolium*
abundant, forming masses locally
- 30 *Rhynchospora cyperoides* Britt.
common
- 31 *Floscopa axillaris* C. Alb.
common locally
- 32 *Burmannia bicolor* Mart.
rare
- 33 *Cyperus iris*
occasional
- 34 *Fraxinea umbellata*
common
- 35 *Lauvagesia erecta* L.
occasional
- 36 (blue green)
common where there is bare mud.
- 37 *Heliconia hirtella* Sw.
common locally
- 38 *Fraxinea glomerata*
rare on open mud
- 39 *Rhynchospora minor*
common
- 40 (arch.) *Eulophia ^{cavii} ~~cavii~~ folia*
common, terrestrial
- 41
local, forming a patch

heads white

shrub 1 m. tall; flowers
white; fruit red, fleshy.

erect or lying against
other plants.

det. Faden '82

stem fleshy

flowers white.

stem very weak.

petals white.

caespitose

sepals dark purple, lateral
petals pink, lip yellow
with wide bright purple
margin.

40442 *Rhynchospora corymbosa*
very local

same - in small patch of
low woods on inundated
ground in savanna

2 43 (Willd.) *Tetracera alnifolia*
common

2 44
common

2 45 *Pycnophodium cernuum* L.
very local

2 46 *Pycnophodium scandens* L.
occasional

2 47 *Chrysobalanus icicularis*
commonest tree Adans. & Thunb.

same on moist white
sand in savanna

1 48 *Cassytha filiformis* L.
common, parasitic on grasses
and sedges.

4 49 *Pycnophodium affine*
common locally

1 50 *Prozera indica*

2 51 *Andropogon*
dominant

1 52 *Xyris capensis*?

1 53 *Panicum*
rare

2 54 *Eleusine*
common

pendent
shrub 3 m. tall

pendent
shrub 3 m. tall. flowers
greenish
up to 1 m. tall, stoloniferous.
climbing in ^{small} tree.

small tree, flowers white.

creeping over grasses, and ^{up} ~~climbs~~
stems yellow

creeping, leaves distichous,
fruiting stems erect.

small tufts, culms erect.
erect.

- 40455 *Xyris ~~capensis~~ aneup?*
 3 very common
- 2 56 *Anadelphica erecta*
 occasional to common here,
 abundant on wetter ground.
 in open areas
 low ridge of
 same, on dry white
 sand, open sand
- 2 57 (logos) *Gaertniera paniculata* Benth.
 common
- 1 58 *Alchornea cordifolia*
 common
- 3 59 (rub.)
 common
- 4 60 *Eragrostis linearis*
 common
- 1 61 *Ernia sonchifolia* (L.) DC.
 common
- 1 62 *Chasia mimosaoides*
 rare
- 3 63 *Mitracarpum*
 common
- 5 64 *Hedyotis*
 abundant

Oct. 10 east of Port Bouet
 on ~~flat~~ flat of quartz sand
 behind beach.

- 2 65 *Ipomoea pes-caprae* sp. *haukenii*
 common
- 3 66 *Boerhaavia "diffusa"*
 common
- 2 67 *Euphorbia glaucophylla*
 common on loose open sand

erect, flowers yellow.
 small tufts, very erect.

2 m.

- low shrub, 1-1.5 m. tall,
 flowers white; fruit green.
- small tree 4 m. tall,
 racemes pendent
- prostrate, leaves stiff;
 flowers white.
- large erect tufts
- flowers purple.
- flowers yellow
- flowers white.

prostrate creeper; sterile.

- prostrate elongate, flowers
 pink, leaves white beneath.
- leaves glaucous,
 distichous

40469

Hedyotis

on loose sand

same - on moist white sand

4

69

(part.) *Belmontia*

abundant

Oct. 11 - trip by road to north.

Swamp forest - characterized by *Rorippa gigantea*, east of Agnès R.Savanna d'Abou - rolling grassland in part with scattered *Clacia*, locally with *Brassia aethiopum* scattered but very striking.

Acacia ~~hyphythos~~ *hyphythos* forest
 much degraded (photo) ^{→ 10}
Glaucium lineare, *Lycopodium*
Cynurus charadensis on cut banks
 (photo). *Acrostrophylum*
secundiflorum - rather in
 this forest - monophyllous.
Diospyros *Mahometum* very common
 from forest at Pankas. *Tamarix*
utilis

decumbent

flowers blue, tube white.

Opt. *Diospyros*

Rather degraded sample
 of *Diospyros Mahometum*
 a few big trees perhaps
 35 m. tall, irregular
 canopy at 25-30 m. open
 shrub layer 2-5 m. dense ground layer

Diospyros chevalieri+ *Mimosa africana**Pennisetum zenkeri*

characteristic

*Mimosa africana**Mimosa africana**Sabicea* (photo)

Claw soil on schist. red

farther on secondary
 forest with *Pandanus* (photo)
B. aceti

In market *Solanum indicum*
Cela. Clacia, *Clacia*, *Clacia*.

Forest mesophylls - with
Triplachitum sclerophyllum (characteristic)
Asplundia opposita

A dense forest 20-30 m.
 full canopy. Lianas abundant
 at least in secondary or disturbed
 aspects. Leaves of trees generally
 small. *Musa nana* is
 abundant in clearings, less
 so northward.

Granite outcrops appear
 shortly after we enter this
 forest.

Musa nana cult. extensive

Reddest trees where the forest
 is cleared have appearance
 of *dipterocarpaceae* sp. *Triplachitum*.

Coffee & bananas very much
 cultivated (*Coffea robusta*)
 No *Elaeis*.

Near edge live

Asplundia problematica
Alpinia latifolia, *Mallotus*
oppositifolia characteristic
 of this forest. Here somewhat
 disturbed but canopy still
 intact. No large crabs on
 trunks.

Nolzi River - secondary
 vegetation with some large trees
 (and *Gonolobus notatum*, *Persea*
foetida). *Canarium madroense*
Rolobolbia, *Persea glauca*
 along road. *Terminalia*

Large *Ceciba*
Spathodea campanulata in
 flower.

North of here *Elaeis* reappears
 locally.

Farther on a rather irregular
 somewhat open forest perhaps
 with many large trees,
 is lower story much
Dracaena arborea large
 bunches of small yellow
 flowers. No climbing
 aroids. Conspicuous tall
 light colored trunks. Many
 lianas in shrub layer.
 Wangenot says rather secondary.
Spathodea common.
 Reddish soils dolerite.

Shortly north of this a
 few *Brassias* and a general
 lightening of the forest,
 at least locally.

Singrobo. Many *Brassias*.
 Very large *Ceciba* abundant.
 Rapid transition to forest
 clear. (photos). *Antrodia* *gibbosa*
Persea

Irregular mixture of
Brassias savanna and
 patches of closed forest
 dominated by *Ceciba*. Also
Terminalia glauca (of today)

The grass is closed, about 2 m. tall, dense to 1 m. of several genera - *Andropogon*, *Luzula*, *Penicillium* etc. with a number of twining and erect legumes. Water-filled depressions common with *Juncus*, *Hibiscus*, *Boraginid*, *sedges*, *etc.* and *etc.* (1 photo)

Brassia scattered over this very commonly.

Mangent says all species of wide distribution and that northward the wooded patches become smaller and more widely separated. Just N of Lakogon.

Some patches of rather open woods. Much *Brassia* and *Cecropia*, low tangled scrub or scrub-forest continuous, many vines. Patches fairly large, many *huet* separated by savanna.

This whole area is burned every year, as Mangent.

Canoe along road in mangrove of wood.

A little more north, low lying land a mosaic of patches of wood and grassy meadows. Large trees and low spreading ones, many vines. *Phoenix reclinata*, (1 photo) wood etc.

To east a small mountain, densely wooded.

Some of savanna is so densely wooded as to approach open forest or open scrub.

Villages fairly frequent.

The road, though dirt, is fairly good, wide, in places washboarded, locally bumpy, but traffic goes about 60 mph.

A little to north, wide stretches of grass with abundantly scattered *Brassia*.

Then patches of open and closed forest, and to east another small wooded mountain. Then an abrupt rounded hill covered on this side with *Brassia* savanna. Some village. Soil here brownish gray.

East - an area of typical *Guinea* savanna with scattered small trees, closed grass to 2.5 m. tall. Some *Brassia*.

In places a mass of laterite is exposed. Little vegetation on it.

(Donget, Wony - Tetraene)

The mountain to the east is, as Prof. Mangenot, of amphibolite, forested on slopes flat-topped, covered on top by a ferruginous crust on which is savanna similar to that on the plains below.

The wine from Bonassou is called "Bangu" or palm water. Like a weak cider, slightly milky, refreshing. Tree is decapitated. Yield wine 20 liters per day, for 1-2 months. Decapitated trees common.

Persea aethiopica has, characteristically, a ~~swelling~~ swelling about 2/3 the way up the trunk of the mature tree.

The soil, when exposed along the road, seems gray but the road is bright red. Red sand to be found below. However, on small knolls the upper meter^{two} is red, below is gray. On very low hills of dolomite the soil is dark brick red, gravelly. The red soil on the roads may possibly come from here, as there are large pits.

Microphyllous forest
Monsonia, Celtis, Trichilia,
all characteristic
Boscia angolensis, also.
Alysicarpus *latifolia*. *Mallotus*
obovatifolia.
Calocoba gilgiana (Flac.)
white fl. *Lecanodiscus*
cupressioides (Lac.)
Near Ndzji R.

Houses in this area have round & wattle walls, thatched roofs. Rectangular.

Hymenostegium aubrevillei
H. afzelii together in
very degraded forest.

South of Ndzji R. is rather degraded microphyllous forest along road *Glossa superba*, said to be native. The yellow, becoming red.

The more open parts of this forest have a solid mass of tangled vine 5 m or more deep - as are lower layers.

1959 Ivory Coast
Ahouga

Oct. 11 - Cote d'Amour

13 km. n. of Abouye, 15 km. of Dabon Luvuvu
in patch of rather
degraded rain forest
(Diospyros-Moraceae)

40470

1 occasional

1 71 Mesobotrya sparsiflora
common in understorey1 72 Psychotria
rare on forest floor2 73 Labicea
in edge of forest

2 74

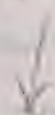
1 75 Diospyros chevalieri
characteristic of this forest asso-
ciation

1 76 Mernecylon

1 77

2 78 (mamm.)
common on forest floorOct. 11 north of Dabon
roadside2 79 Borreria verticillata
common

100 m.



liana, sap blood red.

small tree fruiting ^{and flowering} on
branches and also just
above roots; pulp of fruit
red, pleasantly acid, edible.
leaves dark green above,
pale beneath; flowers white.
- liana, leaves coppery
beneath.
- sterile

sterile

flowers whitish

flower pale yellow, fruit
orange, glossy.

- flowers white

Oct. 11 - southeast of Abizi River
near
in degraded mesophilous
forest.
40480 (Laur.?)

in edge of forest along road
81 *Assidua problematica*
occasional in undergrowth

Oct. 11 several km. s.e. of Zénoua
bridge over Abizi River,
near large Yangze
in degraded mesophilous
forest

2 82 *Hymenostegium aubrevillei*
common
1 83 *Clerodendrum capitatum*
occasional
1 84 *Sclerochiton vogelii* T. Anders.
rare

2 85 *Olyra latifolia*
common in edge of forest
2 86 *Mallotus oppositifolia*
common in edges and undergrowth

Oct. 11 - Bridge over Abizi River

~~forming a tangled thicket~~
roadside

60 m.
↓

shrub, flowers white.

small tree 2.5 m. tall,
branches decussate,
arching upward,
one leaf developed at end
of each, 2 at second node, a
subtotal of 4 at terminal node. Sterile
at this season.

25 m.
↓

small tree; flowers
lavender.
- ~~leaf~~ vine, flowers
white, fragrant.
sterile

culms ascending to
erect, 1.5 m. tall.

- 40487 *Passiflora foetida* var. *brisea*
common
3 88 *Gonolobus rostratus*
in tangled thickets

Oct. 11 - several km. n. of
bridge over Dym River
edge of Mesophilous forest

- 2 89 *Calocoba gilgiana*
rare
4 90 *Tetracera alnifolia*
common

Oct. 11 - southern tip of
Guinean savanna, south of
Singuibo, near Pakolo

in tall grass with
scattered *Borassus*

- 1 91 occasional, twining on grasses
1 92 *Borenia*
rare, growing in small pool of
water
1 93 *Lauvagesia erecta* L.
✓ 94 *Anelasma setiferum* A. Chev. var. *setiferum*
common det. Panch. 1996
2 95 *Bulbostylis*
occasional
3 96 *Panicum*
common
2 97 *Loudetia*
dominant

vine,
forming tangles, flowers
white, bases of corolla
segments purple, fruit orange.

liana, ~~the~~ petals
white, easily caducous.
vine; flowers dull
white to reddish without.

50 m.



twines, leaves sub-glaucous,
flowers white

flowers white, red in center.

stems ascending, flowers
greenish white.

stems weak, supported
by other plants.
erect, small tufts.

- 40499 *Pennisetum?*
2 occasional
4 99 (grass)
occasional
3 500 (grass) *Andropogon*
common
1 01 grass
common
1 02 *Abies*
rare
2 03 (comp.)
common
1 04 *Schwenkia americana*
common along roadside
1 05 (amar.)
occasional
2 06 *Hibiscus*
common in pool of water
2 07 (legum.)
common

Oct. 11 - south of Lomé

in low wet places along road
in mixed woods and savanna

- 2 09 *Thalictrum*
local
4 09 (cassia?)
~~5~~ common

flowers white.
erect tuft
erect. ~~erect~~

heads white.

erect, flowers bright
yellow, dark margin in
center.
twining over grass and shrubs,
flowers rose purple.

1 m.

↓

flowers blue-violet.
leaves glaucous beneath,
herb; flowers blue-violet.

Oct. 11 - east of Lome,
south of Koun Bocca
in open savanna, tall
grass and scattered trees.

40510

Cochlospermum tinctorium
common

2

11 *Bulbostylis*

on bare outcrop of laterite crust

1

12 *Vernonia purpurea* Sch. Bip. (or *gambensis*?)
rare

2

13 *Aeschynomene*

common locally

2

14 *Zornia diphylla*

common in road

3

15 *Borreria*

common

3

16 *Evolvulus "alsinoides"*

common on outcrop of laterite

2

17 (grass)

on bare outcrop of laterite crust.

1

18 (leg.)

rare

4

19 *Borreria*

common

1

20 *Borreria*

occasional

5

21 (rub.) *Octodon setosum* Hiern

common

1

22 *Polygala arenaria* Willd.

rare

3

23 *Mitracarpum*

occasional

3

24 *Eragrostis*

rare

90 m.

shrub, m. tall, flowers
bright yellow; fruit
immature.

flowers pale purple

forming a mat

prostrate

flowers white.

prostrate

crust.

leaves glaucous beneath

corollas white.

flowers white.

erect, calyces red, corollas
white or very pale lavender.
root with wintergreen
odor; flowers purplish yellow.

erect

40525 Indigofera

2 common

4 26 Vernonia nigritiana *obs. ?*
rare

Oct. 12 - trip to Divo by car

In swamp w. of Adopodoum
near Agnedy River -
Cyrtosperma senegalense
is very abundant, flowering,
leaves 1 m or more tall, scape
almost twice as tall.

Raphia gigantea very
abundant - trunks covered
by curled fibers. Fruiting
trees dead - possibly this
species is monocarpic.

Savanna^{with} of Dabou large
plantations of young
Elais. Rolling open land,
with widely scattered
Elais, *Borassus*, and a few
small trees and bushes.

A few termite mounds.
In low spots large patches
of *Euphorbia* *caerulea*.

Some areas dominated by
Imperata. These bright green.
Others by *Pennisetum*.

Margin a transition to
forest characterized by a
mosaic of savanna and

herb 1 m. tall, flowers
reddish.

shrub; rays pale green
without, maroon within.

patches of low thicket and
forest. The savanna
here has more bushes
and abundant termite
colonies, these mostly marked
by more luxuriant grass.
Looks like field of shocks
of hay.

Secondary forest on
sand - *Elais* abundant.
Scattered clumps of bamboo.
Abrus.

Some cultivation of
sweet potatoes + manioc.
Coffee.

Baccharis

Mussaenda abundant
along roadsides.

Cyrtosperma in low spots.

Sikensi

Gardens on low wet
ground.

Plantains in market.
Also *Musa* *nana*.

A few coconuts in village.

La Mene

Many banana patches.
Forest much degraded.

Bineu

Granite outcrops.
Forest mostly destroyed.
Much clearing and thicket.
Scattered tall trees. Musanga
abundant.
Surface soil rather gray.

N'Douci - intersection
of main road. Fair
sized village.
Forest mostly destroyed
or very degraded.

West from here - banana
patches. Many young
Elais but few tall ones.
Small pineapple patches.
Scattered large trees left
in clearings, mostly Ceiba.

Bandama River

Rather high, part of
flood plain submerged. (photos)
Part not - open low wood,
some large Ceiba. Open spaces
with Pennisetum purpureum.
Some bananas.

Current in river swift
river perhaps 150 m. (or 200 m.?)
wide at bridge. Wider above.

Tjassale - small town.
Pineapple fields.

Forest cleared, some trees,
esp. Ceiba, left. Thicket.
Bananas. Manihot.

westward - much clearing.
Large patches of Musc. nana.
Much cacao, partially shaded.
Red soil with much
small gravel. Rolling.

~~Amintoro~~ Amintoro
A few km. w. of Tjassale

A mesophyll forest - large
trees of several kinds, incl.
Lophochiton, ^{Terminalia, Gibe} perhaps 20-35
m. or more, forming a
broken layer, with a
thicker layer at perhaps
20-25 m. A rather dense
shrub layer, esp. of Ruvina.
Many small lianas
some large ones climbing
into trees and locally
tangled on ground.

No climbing aroids
few epiphytes in lower
layers except thin
moss on trunks.

Well developed ground
layer of seedlings.

Locally on ground Leptocarpus
cochlearis and Streptocarpus georgianus
(Grass - broad leafed). Dark clay
soil, very plastic. Where

bulldozed shows a layer of small concretions gravel, 1-2 m. or more in clump and some signs of crust, but is disturbed that it is hard to make out.

Small winding watercourses

Xylocarpus *brunneum* a marantaceous liana climbing into small trees.

Cynometra *afzelii* in undergrowth, 5 m. tall.

On ground *Adiantum* *neglectum* *Pteris* *granitica*

The shrub layer is open enough to walk freely. No palms seen.

This stand gives the impression of being rather little disturbed.

Where the road cuts through the soil there is a clay layer about 1 m. with some small gravel of concretion in upper part, then a mass of concretions abruptly distinct from the clay, its surface roughly following that of the ground. Some quartz fragments mixed with it.

West of this the soil soon becomes dark red, with gravel.

A good stand several km. w. has trees 35 or even 40 m. tall, a nearly closed canopy but very irregular in height at 15-25 m.

and a very loose shrub layer 2-5 m.

Rather sparse ground layer of seedlings, a few ferns, etc.

Some lianas but not ~~very~~ very many.

The layering there is very indefinite - even the shrub layer, which is most definite, seems in places to be two layers, one about 2-3 m, the other 3-5 m.

Walking is easy.

2 spp. *Chrysophyllum* prominent, and *P. gigantecorn*, with

beautiful tall clear trunks. Soil here a chocolate colored clay with scattered large low rounded mounds made by termites. The mounds up to 1 m. high, 3-4 across.

In openings where trees have fallen are dense tangles of lianas, saplings, etc.

There are practically no climbing aroids, and only thin mossy epiphyte layers on trunks. Almost no vascular epiphytes seen.

Assidua seedling has 2 whorls of 3 leaves each.

Anegales robusta an enormous emergent buttresses at base, as most of the larger trees.

In places fairly large trees are only 15-20 m. apart. In other places very widely scattered.

Endophragma is said to be a component of this type, but has been removed from this area because of its valuable wood.

This type mesophilous, though difficult to distinguish from rain forest. Should probably be separated.

The lack of climbing aroids and of most epiphytes is distinctive, in addition to the distinct floristic composition.

The margins, along the road, are densely tangled with lianas to a height of 5 m.

Photo
8-10-50

West, around Urabuci village the country is pretty well denuded, with scattered large trees, patches of cultivation - bananas, coffee, etc. and tangled low thickets.

Then some cacao plantation. Bananas, elais, and areas of forest, mostly rather degraded.

Some cacao mixed with bananas, not shaded. Some cacao without bananas and unshaded.

Degraded forest very much entangled with vines.

Turned rt. off highway to north Diwo Forest.

Forest rapidly improves. *Platycentrum* conspicuous in branches of tall trees.

Forest ~~is~~ is being logged actively and little of it is in good shape.

Trees 35-40 m. tall, trunks to 2 m. diam. - imperious buttresses. Locally closely spaced, 5-20 m. buttresses to 5 m. high.

Dense understorey about 10 m. Some intermediate tree

Photo
8-10-50

Trees being cut for
lumber *Euphorbia*
Terminalia, *Triplachiton*
This must have been a
magnificent forest, but
has been so opened up
that it is mostly a
tangle of dead trees
and branches.

Logging village

Cult. plants

Carica papaya

Saccharum officinarum

Cucurbita maxima

Solanum spp.

Membrum esculentum

Lagerania ^{cucurbit}

Musa paradisica

Musa sapientum

Solanum macrocarpum

" *indicum*

On way back

Amatiro area

Soil in cuts changes
frequently from red clay
filled with gravel to
stiff gray clay with
small gravel layer
under it, and back. The
red more frequent. Some
brownish red.



section showing stiff
gray clay overlying gravel
in road cut at Amatiro.
The gravel surface looks
like an old eroded surface
which has been covered by
a subsequent deposit of clay.
The mixture of concretions and
quartz fragments, as well as
the lack of sharpness of the
latter suggest that the
gravel was deposited alluvially.
If this were cemented it
would certainly look like
a lateritic concretion.

to p
142

1-2
cm. diam.

Large pit dug in soil
on quartz schist. By
decomposition there has
been a relative accumula-
tion of the more resistant
quartz in the top meter.
This is a brown soil
gradually changing to
red. At about 1 m. it changes
to a red clay shot completely
through with vermicular
yellowish-gray clay - some
of this with dead roots following
the clay, some with a tube,
some with no evidence of this.
Some vermicular dark red clay

Oct. 12 - Amatiore Forest Reserve
8 km. w. of Tiassale

in ^{tertiary} primary mesophilic forest

40527 *Drypetes*

common in undergrowth

1 28 *Pulcasia*

rare, terrestrial

1 29 *Peptaspis coarctata*

common, forming patches
on ground

3 30 *Calasia*

common in undergrowth

2 31

common in undergrowth

1 32 *Pteris atrovirens*

occasional on ground

1 33 *Hymenostegium apfelii*

common

3 34 *Adiantum* ~~off~~ *voellii*

common on ground

1 35 (aut.)

occasional in undergrowth
characteristic of type.

2 36 *Cynometra apfelii*

common in undergrowth

1 37 *Thonningia sanguinea* Vahl

rare on ground

1 38 *Trichomanes arorum*

on tree trunk

39

same - 10 km. w. of Tiassale

same

3 39 *Streptogyne gerontogea*

common, forming patches

60 m.

shrub 2 m. tall.

erect; fruit red.

culms ascending, all seen sterile.

much branched shrub,
leaves yellowish green
beneath, dark above.
liana, flowers cream white.

dark green

from fallen tree; flowers white

dark green

sterile shrub.

sterile shrub 2 m. tall
(~~tree~~ reaches 10 m.)

rose ~~pink~~ purple, bracts
stiff.

flat against bark.

60 m.

culms ascending.

- 40540 *Nothobuxus*
common locally in sparse
undergrowth
- 4 41 *Salacia*
common in undergrowth
- 1 42
in undergrowth
- 1 43 *Pavetta*
in undergrowth
- 1 44 *Randia*
in undergrowth
- 2 45 *Leptaspis cochleata*
occasional in undergrowth
- 1 46
in undergrowth
- 1 47 *Olea*
rare in undergrowth
- 1 48 *Palafoxia*
rare, climbing on
tree trunk
- 1 49 *Sterculia elegantiflora*
common
- 2 50 *Assidora problematica*
occasional
- 2 51 (common?)
rare
- 1 52 *Cermta uniflora*
common on ground
- 1 53 *Corynanthe*
rare

shrubs 1-1.3 m. tall; fruit
green.

shrub 1 m. tall; flowers
deep red-range.
shrub, sterile

shrub, fruit blue,
fleshy.

spreading shrub, 1 m.
tall; fruit fleshy, yellow.
spikelets white, inflated.

sterile shrub

shrub 0.3 m. tall; fruit
red, fleshy.

climber, appressed
to tree trunk, fruit red.

gigantic tree, (twig
and flowers from ground).
seedling with 2 whorls
of 3 leaves; sapling with
terminal leaves in
whorl of 3, branches
in whorls of 3, 3 leaves on
a branch; sterile at this season.

shrub; leaves glaucous
beneath, fruit dark reddish.

creeping, sterile. Leaves
pale with red vein, beneath.
small broken tree;
fruit and flowers from ground.
flowers whitish.

- 40554 (arac.) *Nepenthes afzelii* Schott
 1 rare, on ground
 2 55 (Carnel.) *Polypodium paniculata* Benth. det. Faxon 1992
 occasional, on ground
 3 56 *Diospyros*
 rare in undergrowth
 1 57 *Psychotria*
 rare

~~58054~~

Oct. 12 - North Divo Forest Reserve

in tall mesophilous forest
 badly disturbed in places

- 4 58 *Olyra latifolia*
 occasional
 2 59 (Carnel.) *Polypodium glaucum* (C.P. Cl.) Hutchins.
 locally abundant in rather
 new opening
 3 60 *Lecy*
 common along trail
 2 61 *Platycentrum*
 common in tall trees,
 epiphytic
 1 62 *Thonningia*
 rare
 3 63 (grass)
 occasional
 1 64 (sagitt.)
 occasional
 1 65 *Pteris*
 rare, on fallen log

erect, fruit orange.

erect.

slender small trees

fruit green.

stem green; fruit light
 blue, fleshy.

15 m.

canes caespitose, up to
 2 m. tall.

det. Faxon
 1992

herb to 0.7 m. tall,
 inflorescence scarlet,
 fleshy, flowers greenish
 and yellow; fruit
 green, turning black.
 specimens knocked
 to ground; frond bearing
 glaucous beneath.
 dull rose purple

small tree, leaves silvery
 beneath, sterile.

- 40560 *Carinata uniflora*
common in trail
- 4 67 *Porreria*
very local in ^{wet} opening
- 2 68 *Rivina* (?)
local in weedy opening
- 1 69 *Piper umbellatum*
common in disturbed places
- 1 70 *Palisota bracteosa* C.Bell. det. Eaden 1960
rare, on ground.
- 1 71 *Parkia elegans* T. Anders.
common along trail
- 1 72 *Leptaspis cochlearata*
rare
- 2 73 *Rumex longipetiolis*
rare in undergrowth
along trail

- creeping, scape erect,
flower white.
- tangled mass of
reclining elongate stems
flower white.
- erect herb; flower white.
shrub 1.5 m. tall, aromatic;
spikes white.
fruit white, fleshy.
- erect herb, flowers bright
orange.
- shikata white, inflated
- shrub: ~~calyx~~ calyx dark
purple, corolla yellow.

Oct 13 - Swamp forest
east of ~~Sagbo~~ River
standing water several
dm deep.

Irregular closed forest
10-20 m. high.

No distinct stratifica-
tion except for ground
layer 1-2 m. tall of *Cyrtosperma*,
Aframomum, and various
vine.

Trees with thin layer of
moss, scattered epiphytes
i.e. *Rhipsalis cassytha*,
Nephrolepis sp.

The petioles of the *Cyrtosperma*
are quadrangular, with
a row of short prickles at
each angle. Leaves 1-3 m. tall
of some rattan, *Calamus*
decoratus, forming tangle
in undergrowth.

Ancistrocladus,
Xylocarpus, *Ostiocarpus*,
Symphonia gabonensis.

Many trees with
stilt roots, e.g. *Uapaca*,
Xylocarpus, *Symphonia*.

Mitragyna largest tree, with roots
The *Cyrtosperma* is common
in the interior of the swamp
but abundant near the edge.

Water all the year.

In some areas a shrub
layer 2-4 m., little
Cyrtosperma. This type
in the interior of the swamp.
A little *Raphia* here.

19/10/59

Trees to 25 m. or more here.
Larger ones spread 6-20
m. ~~st~~ *Uapaca adolab*,
Uapaca palustris, *Mitragyna*.

Ants very abundant
in plants. One found
said to give a fever.

Bases of stilt root trees
have accumulation
of litter that may be
fairly firm. These
and fallen trees have
an abundance of *Nephrolepis*.

Nearer the river this type
changes to a practically
solid stand of *Raphia*
gigantea, completely
closed above, 5-10 m. tall,
open beneath, ground
covered by dead leaves,
in places ferns, some
admixture locally of
other trees.

stilt roots

This palm swamp, said to develop after the other trees have been removed. *Raphia* occasional in other swamp types.

The *Raphia* is monocarpic. Around the edges and in places where the palms are masses of *Thelypteris*, *Cyrtosperma*, *Aframomum*, *Polygonum*, *Stipularia*, *Aspilota latifolia* (like *Wedelia*), and a large grass. In open water *Nymphaea*, *Lotus*, *Lemma*, *Azolla*, *Utricularia foliosa*, *Pistia stratiotes*, a little *Ceratopteris*.

The water in the swamp is dark brown.

Part of swamp has been destroyed by fire.

Oct. 13 - Adiopodoumé, 17 km roadside thicket

40579
?

Cardiospermum
common

Abidjan
✓ of Adiopodoumé
5m.

vine, flowers white,
fruit inflated.

Oct. 13 - swamp east
of mouth of Agnèby River
in open water ~~at~~
along road

- 40575 *Utricularia foliosa*
common
2 76 *Polygonum tomentosum* Willd.
abundant

- 1 77 *Ceratopteris cornuta*
rare, floating

- same - roadside banks
3 78 *Aspilia latifolia*
abundant

- 2 79 *Phyllanthus*
occasional

- 3 80 *Asystasia "comandiana"*
common
same - edges of swamps

- 3 81 *Harrungana madagascariensis* Lam.
common in edges of swamps

- 2 82
common

- same - in wooded swamp
3 83 *Rhipsalis baccifera*
occasional epiphyte on lower
part of trees

- 2 84 *Heliconia*
common

- 1 85 *Asplenium nidus*
rare epiphyte on tree trunk

west of Tongon Agban
↓

flowers bright yellow,
emerged.

tangled herb,
flowering stems
ascending emerged,
flowers pale pink.

tangled herb, rays
deep yellow, disk dull yellow.

tangled herb, stem
quadrangular; flowers
white with purple palate
tangled shrub
~ 2 m. tall, fruit yellow
to brown.

shrub 2 m. tall,
flowers bright purple,
reddish outside.

stems erect

- 40586 *Psychotria*?
rare
- 2 87 *Rhabdopetalum*
occasional in undergrowth
- 2 88 (rub.)
occasional
- 1 89 (rub.?)
- 1 90 *Azolla pinnata*
in water, floating
- 2 91 *Calamus decuratus* Maxon & Wendl.
~~occasional~~ occasional in edge of
- 92 *Cyrtosperma senegalensis*
abundant at edges,
common inside

Oct. 13 - ~~at~~ ~~near~~ ~~at~~

- 10 93 *Pteridium aquilinum*
abundant in a few
spots along road
on sandy ~~at~~ bank

Tryon (letter 14 Aug 1977) says this is
typical var. *aquilinum* except for slow
expanding leaf apex.

shrub 1 m. tall, fruit green.

~~shrub~~ shrub
2.3 m. tall, fruit immature.
shrub, buds only.

shrub or small tree,
fruit green,
green.

stiff tangled liana,
fruit benedict.

erect, leaves to 1.5 m.,
scapes to 2 m. tall,
petioles quadrangular
prickles along angles;
scapes hexagonal,
prickles along angles;
spathe yellowish bronze
green outside, purple
and white striped
within, spadix almost
black.

20 m.

fronds erect, 1.5-2 m.
tall, appearing
indeterminate, tips
still unfolding when
lower pinnae are mature.

Oct. 14 - trip to Bandama
savanna

Western part of Dabon
savanna - vast areas
planted or being planted
to Elaeis, Hevea, Derris.

The newest of these
are being provided with
contour levees and cross
levees. Most have a
mat of legumes on ground.
All is on gray or brownish
sandy soil.

Forest around arm of
lagoon contains a substantial
portion of Elaeis, as a closed
very mixed forest. Parts
up on flat ground have
been transformed into cacao
plantations.

Margins of lagoon
have broad areas of
Echinochloa pyramidalis
very similar to grasslots
of upper Amazon.

west of the arm of the
lagoon is a rich savanna
on sandy soil, rather narrow
and winding through the
forest. *Borassus* very common,
scattered. A few small
~~stout~~ trees and shrubs.
Thick grass to 2 m., closed
layer to 1 m. Legumes -
Tephrosia, *Indigofera*, etc.
abundant in grass. ^{*Cassia monnina*}
A large ~~shrub~~ ^{*Hybanthus*} and a
smaller ~~shrub~~ ^{*Acrocydium*} are
dominant grasses, with
a slender *Panicum* also
abundant. A few seedling
Borassus in grass.

The forest bordering this
is perhaps 25-30 m. tall,
with rather thin but
complete canopy at mid
height, perhaps 10-15 m.
open above.

Shrub layer very thin,
irregular. Ground layer
also thin, of seedlings,
grasses, *Marantaceae*.
Soil brown, very sandy.
No really large trees,
few medium large (9-10 dm.)
some lianas but rather
few. Some *Culcasia*
on tree trunk.

Termite mound, holes common.

photos

margin
very
tangled

The origin of this ~~savanna~~ is not obvious, as the soils ~~is~~ is almost identical with that of the surrounding forest. No topographic relations. This leaves both factors - man, or elephants & buffaloes.

The forest is old secondary or at least much altered, as *Elaeis* is abundant and very large trees lacking.

Farther on a savanna of almost purely *banian* with scattered *Brassia*, but most of these dead from tapping for *bangui*. Scattered large shrubs or very small trees 3-4 m. tall. The grass 2 m. tall, very dense.

Secondary thickets here and there with *Allophylus africanus*, *Bridelia*, *Paracoccophloe* *esculentus*. Tangled with vines.

Prothium diffuses along roads. In places the *Brassia* is very abundant in the savanna, especially where ground is level.

Photos

In places thickets, extending from patches of forest. Have surrounded tall *Brassia* trees. Taken as proof that forest is encroaching on savanna.

Locally termite mounds, grass covered are abundant. Possibly much more general but only exposed where tall grass is burned off.

West of this alternation of forest and savanna. Then mostly a mosaic of cultivation and thickets. Small savannas, some without *Brassia*.

Along Bandama River secondary thickets about 5-7 m. tall, solidly tangled with vines, but more open within. Some small meadows, *Elaeis* abundant, some *Cocos*. *Alchornea*, *Paullinia*, *Cissus*, and various other things in thickets. *Panicum maximum* in meadows and along river. Water is quite high.

Photos

Brassias have generally a swelling in the trunk about $\frac{2}{3}$ the way up. Has been suggested that this is due to a more adequate water supply at some period. This seems unlikely, as the feature is not correlated with terrain. More likely reflects natural increase and decline in vigor of tree, controlled genetically. Would be interesting to look at photos taken 20 years ago or more.

In Dabon area are large expanses of ~~the~~ plantation of *Clavis*, perhaps 8 m. tall, spaced about 4 m. Crowns are closed, ground covered with closed herb layer. No shrubs. Epiphytic ferns locally, on trunks. Mostly not.

In the seaward part of the Dabon savanna there seems to be

Near Dabon ~~area~~ a great exposure of 10-15 m thick ~~layers~~ of more or less indurated lateritic nodular material ~~side~~ of ravine system dug away for road material. On top there is a fine black soil. No sand. Forest on top. Near lagoon.

East of Dabon in a road cut a layer of fine pernegritous gravel (buckshot) ~~at least~~ ^{at least} 1 m thick or more, overlain by 2 m or more of reddish sand. The layer of gravel is sharply defined, rather irregular, roughly following the surface contour.

Oct. 14 - savanna between
Cosrou and Mendibo,
east of Bandama River
in margin of forest patch.

40594

(sub. X a Logan)

2

occasional

4

95

Premna pirsuta

common

hispida Benth. det. Moldenke 1971

5

96

common

3

97

Uncaria africana

same - in tall grass

2

98

Indigofera pulchra Willd.

common

2

99

Tephrosia

common

40600

Polygala multiflora Poir.

common

6

01

Aspidis angustifolia

common

4

02

Hyparrhenia diplandra

dominant grass

~~03 (lab)~~

same - edge of thicket

3

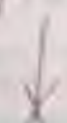
03

(lab) Hoslundia opposita

common

~~04 (lab) Hoslundia~~

40 m.



scandent shrub.

shrub; flowers
pale green; fruit immature

liana or scandent

shrub; flowers
red without, pinkish
cream within; fruit immature

liana; flowers bronze,
fragrant.

suppulent herb

1 m. tall; flowers red.

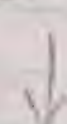
herb 1 m. tall; flowers
yellow.

herb to 1 m. or more tall;
roots with wintergreen
odor; flowers bright
blue-violet.

loosely branched

herb, heads orange-yellow,
erect, to 2 m. tall, scarcely
tufted.

60 m.



scandent suppetescent
herb, aromatic, flowers white,
fruiting calyx orange, fleshy.

- 40604 *Allophylus africanus*
 3 very common
- 3 05 *Bridelia*
 very common
- 4 06 *Barcocephalus esculenta*
 common
- 2 07 *Hedyotis corymbosa*?
 common on bare soil along road
- 2 08 *Boerhaavia*
 common along road
- same - roadside
- 1 09 *Boerhaavia*
 common,
- 2 10 *Boerhaavia repens*
 common
- 3 11 Oct. 14 - ~~at~~ west of Labou
~~at~~ *Rauwolfia vomitoria*
 on eroded laterite

- shrub 4 m. tall,
 fruit fleshy, red.
- shrub 4 m. tall, prickly,
 fruits black when ripe.
- shrub 3 m. tall, semi-
 scandent; fruits
 immature, said to be edible.
- prostrate
- prostrate; leaves whitish
 beneath; ~~panicle~~
~~ascending~~ flowers white
 tube long, limb funnel-form.
- 70 m.
 16 ascending.
- prostrate; leaves white
 beneath; panicle ascending.
- 90 m. shrub, fruit orange.

Oct 15 - Banks Forest

toward
creek
along
creek
canyon

Raphidophora common
on trunks and hanging.
Dorstenia Embergeri and
Hedyotis chevalieri along
roadside, also ~~Fe~~ Cainta-
Begonia quadrilata,
Trichomanes, Ilex, Marattia
fascinea, Selaginella,
on cut banks.

Enamouliana a Neupeltia
(Lindl.). Some trees here
have many epiphytes.

Cynometra is a very tall
broad tree, young growth red.

From the first view
present a good view
of the top of a forest
largely of Cynometra
alata, with reddish
crowns. Top more or
less level, no emergents
in foreground. In back
are some a different
sort of forest.

From A

Agave -

beach, parallel beach
ridges of quartz sand,
with thin rather poor
coconut grove, with
carpet of Schizanthus pulchellum,
patches of Agave
obliqua, Diotis maritima,
etc.

The Schizanthus is
of exactly the habit of
Paspalum vaginatum
and Sporobolus virginicus,
forming a close gray-green
carpet 2-4 dm. high.

Open mangrove swamp,
water at high tide knee
deep. Rhizophora racemosa,
Dalbergia principal species,
here reaching 5 m. with
widely arching roots
in places systems confluent,
elsewhere not. Scattered
shrubs of Dalbergia, Hibiscus
tiliaceus. Patches of Paspalum
vaginatum (1 m. tall), Anostichia
aureum. The Dalbergia is
scandent. The Paspalum
patches are rather thin.

In margins all of
these species (except *Rhizophora*
and *Sonneratia*) form tangles,
with *Sonneratia nodulosa*,
locally *Alchornea*, *Breynia*
and *Conocarpus*.

Beach here is steep, up
to perhaps 0.5 m. above
extreme high tide wash
then a lagoon 10 m wide
with thin mat of creepers,
etc. Then a metal pier,
then a broad berm
perhaps 25-30 m. covered
by a solid mat of *Sonneratia*
margins
coconuts being planted
on this.

Oct. 75 - Yape Village

Oct. 15 - Banco National Park
5-7 km. n.w. of Abidjan
in tall rain forest on deep
sand soil.

40612 *Trichomanes cypripedoides* Desv.?
common locally on road cut

1 13 *Delaginella muroris*
common locally on road cut

1 14 *Hedyotis chevalieri*
occasional along roadside

1 15 *Marantochloa*
occasional in edge of

2 16 ~~*Pipturus*~~ *Arthropus* *obtusatus* (R.Br.) J. Sm.
climbing on tree trunks.

2 17 *Antea*
along road, semi-open

2 18 in undergrowth

2 19 *Coffea*
in undergrowth

2 20 *Parrotia*
in open, at edge of forest

2 21 *Usteria*
in undergrowth

~~22 *Hibiscus tiliaceus*~~

Oct. 15 - Agoueti, on
beach east of Abidjan

2 22 *Hibiscus tiliaceus* L.
rare in mangrove swamp

3 23 *Cassipourea*
common around edges
of mangrove swamp

6.8 m.
↓

flower white

shrub

shrub 1.3 m., flowers
yellow, fragrant.

liana, flowers white,
very fragrant.

shrub 2.5 m. tall, flowers
white.

shrub 3 m. tall, calyx
pale green, corolla
dull purple.

0 m.
↓

shrub 4 m. tall, flower
yellow, center very

dark maroon

low spreading tree.

branches elongate.

- 40624 *Rauwolfia vomitoria*
rare, margin of mangrove swamp
- 1 25 *Hedyotis*
in grass at edge of mangrove swamp
- 1 26 *Agelia obliqua*
common on sand flat
- 1 27 *Maytenus*
common at edge of mangrove swamp
- 1 28 *Diospyros*
common on sand flat back of beach
- 1 29 *Alchornea cordifolia*
margin of mangrove swamp
- 3 30 *Flagellaria guineensis*
common on sand flats and on margin of mangrove swamp
- 2 31 *Rhizophora racemosa*
dominant in mangrove swamp
- 3 32 *Cyperus maritimus*
common at top of beach
- 1 33 *Diodes vaginata*
plant nearest high water mark
- 4 34 *Hydrocotyle bonariensis*
common under trees near edge of swamp
- 1 35 *Diodes maritima*
dominant on sand flat just back of top of beach
- 43 36 *Conocarpus erectus*
local at edge of mangrove swamp
- 1 37 *Avicennia nitida*
local at edge of mangrove swamp

shrub 2 m. tall,
fruit green.

erect, supported by grass;
flowers white.

shrub 1 m. tall flowers
white.

sterile shrub 1.5 m. tall.

low rounded shrub,
sterile.

vine, 1-2 m. long,
flowers white, fruit red,
fleshy.

small tree with
arching stilt roots.
loosely caespitose

prostrate, very fleshy.

rhizome buried,
inflorescences and
petioles erect.

prostrate, forming a
loose mat; leaves very
fleshy; flowers white.

tall loosely branched
spreading shrub; leaves
fleshy - coriaceous.

sterile tree 6 m. tall, leaves pale beneath.

- 40038 *Scaevola plumieri* (L.) Vahl
very local on beach
- 39 *Alternanthera nodiflora* R.Br.?
at top of beach

Oct. 17 - Bamboo Forest

at edge of arboretum, in
a row of trees planted
by M. Aubreville in 1970
same species
at exposed ~~edge~~ end of row
the tree is several times as
large as the others
farther in. *Raya* is *in*
alternates with *Tournefortia*

at the tower there seem to
be an abundance of great
earthworms. Their casts
are very abundant on
the ground in the forest.
These often stand erect
1-2 dm. and 1.5-2 cm. thick
with a small hole, 1-2 mm.
in center. Certainly a
strong influence on the
surface soil.

low shrub 3 dm. tall;
leaves very fleshy; flowers
yellowish.
prostrate, leaves fleshy.

This forest has a
much better developed
shrub layer than
in Amazonian or Pacific
Colombian or Malayan
rain forests, and is possibly
a thinner or more irregular
canopy. Distribution
of large trees about the
same. Perhaps somewhat
fewer intermediate ones.

along a small stream
Uapaca paludosa, with
conspicuous stilt roots,
is very common. Undergrowth
of large leaved *Aroid* and
Zingiberaceae on ground
near road.

Oct. 17 - Banco National
Park, 5-7 km. n.w. of Abidjan
in ~~the~~ tangled
margin of forest along road

40640

2

occasional

2

41

Psychotria

occasional

2

42

Calocarpum

occasional

1

43

Cratogeomys

occasional

2

44

occasional

2

45

Beilschmiedia

occasional

2

46

Randia

planted in arboretum

13

6.0 m.

}

tangled scandent
shrub.shrub 15m. tall; inflorescence
purple. fruit green.
vine, flowers green.

fruits green

tall shrub, ~~tree~~
fruits immature,
spines soft.

shrub.

8.0 m.

small tree 4m. tall;
~~flowers~~ corolla bent
downward tube green,
throat and lobes white,
odorless.

Oct. 18 - Trip by auto north
from Abidjan to Yapeu Lake

As soon as we enter the
schist area, the road cuts
have a covering of *Lycopodium*
cernuum, *Pityrogramma*
calosmelanos and *Gleichenia*
linearis also *Polypodium scolopendria*.

The decomposing schist
is a bicolored mixture of
purple and pale green. The
soil is red, clay.

Little difference in the
general secondary vegetation
between sand and schist.
Musanga abundant,
especially along roads.

3/4 km from
Yapeu Lake The *Gleichenia* is
very luxuriant, young
parts with slight fungus
tomentum, especially at ramification
of blade.

Anthocleista nobilis,
seedling, have a most
astonishing arrangement
of spines and stipules.

Crematospathum hookeri
Mapania characteristis
of the pelohygrophil forest.

The pelohygrophil
forest is perhaps a bit more
hygrophilous than the
psammohygrophil, but
the latter, for an equal
degree of hygrophil,
requires more rainfall.
Some of the plants in the
pelohygrophil are restricted
to this type because
of the greater reservoir of
effective moisture in
the clay (see Maynard).

Bananas can be raised
here on the higher ground
as well as low, which
on the sand only successful
in the low moist parts.
(But this is probably true
only after clearing and
rather complete destruction
of the microclimate?)

just before

At about 40 km north of
Abidjan an extensive
banana fields with
only a few widely
scattered large trees.

Road toward Agboville -
forest destroyed, many
coffee plantations.

from 1/2

Large pit dug in soil on quartz schist. On decomposition there has been a relative accumulation of the more resistant quartz in the top meter. This is a brown soil gradually changing to red. At about 1 m. it changes to a red clay shot completely through with vermicular yellowish-gray clay - some of this with dead roots, ~~some~~ following the vermicules, some with tubes, some with nothing. Vermicules 1-2 cm. thick. Some vermicules of dark red clay.

Below this a 3-m. or more of yellowish brown or reddish brown clay, stiff. Roots penetrate to 5 m. in this profile. (Sol percolithic leucine)

Possibly the paler color of the clay may be result of reduction due to presence of material of dead roots. Otherwise the vermicules appear and would be hard to miss.

Yapo

An example of helohygrophil forest probably rather degraded, a prominent shrub layer and ^{canopy} canopy of medium trees. ^{plus some large trees} Another piece with scattered enormous trees to 40-50 m. x diam.

(*Mastoloma localis*, *understory* (*Rapateaceae*))

Rather open canopy perhaps 25-30 m.

Dense shrub layer, ^{ground} *Napanea*, *Mastoloma*, *Myrsinaceae*, *Clusiaceae*, *Rattans* in shrub layer. Wet ground.

Mangrove says perhaps virginity of 9 or 9. 5 different rattans together.

Eriosepium choheris

E. macrostachyum

Calamus

Anerostophyllum *speciosum*

A. secundiflorum

Many leaf epiphytes. Also considerable trunk and branch epiphytes.

Yapo. ^{road} ^{100 hectares}
 forest A forest planted to
 two species *Tarrietia*
utilis + *Kaya* ^{in 1930}
 average spacing 2-4 m.

Growth now rather
 uneven, dbh. from 1 dm. to 5 dm.
 by 25-35 m.

Dense under story
 4-8 m. tall, not including
 any seedlings of the two
 planted species.

No thinning.

Across road - a row of
 trees planted in 1936 - *Kaya*
inensis - larger trees
 evenly to 7 dm dbh. 30 m. tall.

Rows 10 m. apart.

Space between filled with
 an understory of saplings
 2-10 m. tall.

These rows were planted
 in narrow cut rows
 in the ~~old~~ forest that
 was then (secondary?)
 and as the trees grew
 the width of the strips
 cleared was increased.

70 ha reserve
 of Yapo forest -
~~Mostly secondary forest~~
~~small~~

Almost completely
 undisturbed

Scattered enormous
 trees, and *Sacoglottis*
gabonensis (buttered
 4-5 m).

Canopy at 40 perhaps
 30 m. irregular, rather
 open. A dense under-
 story 3-10 m. tall

Ceiba with buttresses
 10 m. long. great trunk
 total height perhaps 40-45 m.
 Large-leaved aroids on
 trunk.

Morania very
 abundant on ground.

Perhaps 10 spp. ~~leaves~~
~~disappear~~ in forest
Ficus magnifica
 a large banyan.

considerable variation
 in density.

Oct. 13 - Yapo forest, south
of Yapo
in "pelohygrophile" forest

40647

Chrasalia

in marginal thicket

1 48

~~"Uragoga yapoensis" Hitchc.~~

occasional in trail

1 49

"Uragoga yapoensis" Hitchc.

occasional in trail

1 49

(copil.)

occasional in undergrowth

1 50

Riospyros

occasional

1 51

(rub.)

occasional in trail

1 52

Psychotria

occasional in under-
growth

1 53

(thymel.)

rare in undergrowth

1 54

Gymnodaphn longistylis Hitchc.

local, on heaped up

decomposing leaf litter

between buttresses of a giant tree

1 55

Trichomanes erosum

on buttress of large tree

1 56

(moss?)

hanging from twig in

undergrowth

5 57

Napoleona leonensis Hitchc. & Planch.

in understory

60 m.



shrub 1.5 m. tall,
~~fl.~~ inflorescence white,
flowers white externally,
yellow within, tube
doubly curved.

suffrutescent herb,
0.6 m. tall; leaves whitish
beneath, bracts whitish
without.

sterile shrub 1.5 m. tall.

sterile sapling.

fruits fleshy, bright
blue.

slender shrub 1.3 m. tall,
fruit red.

shrub, fruit red, fleshy.

white

prostrate

small tree, corolla whitish,
striped with red, caducous.

- 40658 *Randia melleri*?
in undergrowth
- 1 59 *Mapania*
common on ~~forest~~ ground
- 3 60 *Canthium*
occasional in undergrowth
- 1 61 (Euph.)
occasional in undergrowth
- 1 62 (Moss) *Dorstenia*
occasional in undergrowth
- 2 63 *Lasiacanthus*
occasional in undergrowth
- 1 64 *Oreocetes*
occasional
- 2 65 *Rinorea Decorella paradoxica* Chas.
occasional in undergrowth
- 2 66 *Randia macroantha*
occasional in undergrowth
in secondary forest
- 4 67 (rub.)
occasional in secondary
forest.

Oct. 13 - 25 km. north of Abidjan
a road cut in secondary
forest on decomposing schist

- 2 68 *Anthocleista superba*
seedlings
- 1 69 *Lycopodium complanatum*
abundant, characteristic
of such cuts in this type of soil.
- 2 70 *Lycopodium smithianum*
common

erect shrub 2 m. tall,
fruit immature.

shrubs 2 m. tall,
branches distichous,
flowers white.

shrub

scandent shrub, corolla
whitish somewhat unequal,
flowers bright yellow.

shrub 1 m. tall; seeds
green, fleshy.

slender shrub 2 m.
tall, flowers pendent,
white.

shrub 3-4 m. tall,
inflorescence pendent,
flowers white; fruit green.

100 m.

erect, 0.6 m. tall (note
curious spine arrangement),
stoloniferous; stems
erect.

climbing in bushes,
all seen sterile.

Oct. 23 - Banks forest
Deep ravine - has the
characteristics of
a disturbed forest, openings
in the canopy, bare places
on ground, etc. but probably
only the characteristics of this
sort of site. Many trees
have fallen.

Mapania coriandra and
Cyathea camerooniana
found locally here in
ravine, not general in
level part of the forest.

Rather few even fairly
large trees, though many
tall ones. *Lianas* fairly
abundant. Ferns, esp.
Marattia fraxinea, not
abundant than elsewhere
in this forest.

Soil yellowish brown,
much more clay than in
~~most parts~~ upper layers
of the tertiary sand.

Oct. 23 - Banks Forest, 5 km. n.e. of
^{rather} dense undergrowth in
rather open rain forest.

40671 *Polypodium scolopendria*
epiphytic

72

73 *Asplenium africanum*
rare, epiphytic on tree trunks

Another place on
high flat ground
Medium large trees
about 30 m. tall, spaced
10-15 m. Trunks to 5 dm. dbh
canopy rather open.
Large *Diospyros sanguinica*
to 4 dm. thick, beautiful
corrugated bark.

Very sparse layer 15-20 m.
tall

Thick shrub layer 2-4 m.
Cavities and seedlings
very abundant on ground.
A few rather large
trees e.g. *Lophira alata*.

Abidjan
50 m.
↓

low shrub, ~~fruits~~ scarcely
branched, fruits fleshy, orange
resette for very short erect ~~apophyses~~

40674 Cola

75 (comb.)

epiphytic

same headwaters of
Banks River
in wet forest in deep
wet ravine.

1 76 *Dracaena surcuifera* Lindl.
rare in undergrowth

2 77 *Lasianthus*
rare in undergrowth

4 78 *Ctenitis*
common on ground

1 {79
80

rare in low undergrowth

1 81 *Mapania coriandris*
occasional on ground

3 82 *Carintha hirsuta*
common on ground,
especially so along trail

Oct. 24 - Adiopodoumé 15 km.
in Chacis grove on Recceish
Station grounds.

1 83 *Vittaria guineensis* Desv.
common on Chacis trunks

2 84 *Hedyotis*
occasional ~~among~~ weeds, in

3 85 *Phyllanthus*
common among weeds in

shrub 2.5 m. tall,
fruit immature.
leaves distichous, very
fleshy, buds white.

20 m.

low shrub: sterile.

slender shrub, fruit
dull lavender.

small shrub flowers greenish
fruit orange

leaves dull, rather
reddish, green.

prostrate, creeping,
fruiting branches erect;
fruits and calyces
bright orange.

no of Abidjan
35 m. (comb.)

fronds
pendent, leathery.

procumbent, flowers
white.
erect.

shade

- 40686 *Mikania*
climbing over bushes
2 37 *Urena lobata*
edge of grove
3 38 *Nephrolepis "biserrata"*
abundant on trunks
of trees.
1 39 *Platyserium africanum*
on trunk of tree (perhaps
artificially placed there)

Oct. 25 - 33 km. n. of Abidjan
steep road-cut in clay soil
in ^{secondary} forest.

- 1 90 *Virentia procumbens*
occasional
2 91 *Bomarea*
common
2 92 *Lankesteria bovieri* C.B.C.
occasional
1 93 *Bomarea*
rare

~~erect herb~~
vine; flowers white with
honey-like odor.
— suffrutescent herb, 1 m.
tall. flowers rose pink,
closed in afternoon.
fronds pendent.

densely caespitose
with basal fronds
not overlapping.

100 m.
↓

weak herb, ~~flowers~~ ^{corolla}
white, funnel-form.
flowers white.

erect; bracts deep maroon-
purple, corolla white.

Oct. 25 Yapo Forest,
botanical reserve

Cuviera - small slender tree
in secondary thicket.

Ptychopetalum - 1 spec.

In these secondary tangles
leaf epiphytes are fairly
abundant in shrub layer.

Labiera - 1 spec.

Diospyros chevalieri, Tamarix,
Mapania - very characteristic
of this forest.

Panda

Iligera reptans - 1 spec.

Discussion of time taken
for large tree to decay after
falling - order of 12 years,
depending on wood, etc.

Woods utilized Tamarix, Endo-
phyllum, Rayer, etc.

Culcasia scandens

C. angolensis on trunk
Behaya (Apor.) looks
like a delicate climbing
form.

Gardenia abekrouta
(Didymos...)

Klaineodoxa gabonensis
has curious protruding
adventitious roots on trunk.

A rather open pelt-
hygrophil forest on somewhat
dissected ground
irregular middle
story with many
lianas and thick
shrub layer, with
rattan. Mapania,
C. unta, persea, abundant
on ground. A few scattered
very large trees.
In one of them, at top
of about 30 m. of bare
trunk, Platycium
apricarium.

Adapa guineensis - still

U. esculenta - roots

Parinari caphalensis - very large

Places where canopy
gets thick the shrub layer
thins out. Ground layer
stays about the same,
perhaps less Mapania.

Ilex hiemalis - slender
shrub.

Drypis affinis - liane
with wicket retrorse spine.

Ants attacked by Cordyloceras
clasp twig with feet and
pincers. die that way

The roots of *Paucasia* in places form a dense closely adhering mat on the tree trunks.

In this forest the lack of large trees of the more useful species and the preponderance of useless ones suggests that 20-30 years ago it was exploited selectively. (Mangrove)

Certainly the structure suggests this.

Oct. 25 - Yapo Village

Scattered trees, thickets patches of bananas, manihot, tangles of vine, *Conocarpus* trees, many oil palms.

Great termite nests, 1 m. thick 2 m. tall.

photos

~~at~~ n.w. of here
a patch of secondary tangled

scrub has *Rutidea flammula* *Hedyotis* *Peltospermum* (?) a twining one.

The scrub is about 3 m. tall has scattered oil palm, *Passiflora*, manioc, etc. Lianas excessively abundant.

A few scattered taller trees.

This is said to be on the edge of the mesophile forest, though little left to show it. - *Mallotus oppositifolius*, etc.

Some largely cultivated country. Scattered large trees - *Triplachton*, *Terminalia*, etc. *Clusia*.

Tangled thickets bordering roads and cultivated patches.

Musa present but not abundant. *Persea* etc.

Oct. 25 - 2 km. n.w. of Jol. 40 km n. of Abidjan

tangled secondary thickets around manioc patches, *Macaranga*, very spiny and brittle, tangled with *Mussaenda* and *Hedyotis*, etc.

Oct. 25 - Yapo Forest, south of Yapo
in and near Botanical Reserve
in tall dense rain forest

- 40694 *Psychopetalum*
occasional in undergrowth
1 95 *Panda oleosa*
occasional in undergrowth
3 96 (Marant.)
common

- 5 97 *Trichomanes erosum*
abundant on trunks
of certain trees

- 1 98 (rub.)
occasional

- 1 99 *Gliricidia verticillata*
climbing on branches of trees

- 40700 *Randia*
rare in undergrowth
2 01 *Cuviera*
in marginal thicket

- ✓ 02 *Strychnos aculeata*
common

- 3 03 *Palisota* ~~(bactera)~~ *bactera* C.P.C.
very local, on ground

- 1 04 *Calasia*
1 05 *Psychotria*
solitary on ground

- 3 06 (leg.)
in roadside thicket

60 m.

↓

flowers white; fruit crimson.

sterile shrub

much branched scrambling
herb. to 1.5 m. tall. leaves
glaucous beneath;
fruits red.

rhizome clinging to bark

fruit lavender.

seedling; pieces of young
growth; fruit from ground.
shrub 1.5 m. tall; bud only.

small tree 5 m. tall.
corolla unicolored, pale
green without, white
within except reflexed
green lobes with white
midrib.

pieces from erect branch
from large tree, sterile.
slightly caespitose,
bracts bronze purple.
flowers green
flowers white.

liana; fruits inflated
outward, purple.

#40907 *Musanga cecropioides*
2 common in roadside thickets

- 1 08 *Cordicera*
rarely seen, parasitizing
ants
- 3 09 *Lomariopsis guineensis* Kuhn
common
- 1 10 *Mapania*
common
- 2 11 *Ilex congesta*?
occasional in undergrowth
- 1 12 *Gardenia abbeokuta* Hiern
rare in undergrowth
- 1 13 *Polypodium punctatum*
epiphytic, high in tree
- 2 14 *Chytranthus* (Lam.)
occasional in undergrowth
- 1 15 (marant.)
occasional
- 1 16 *Mapania*
occasional

Oct. 25 - several km. N.W. of
Yapo station
in thick ~~secondary~~ tangled
secondary scrub.

17 *Hedyotis*
common

Tree 8 m. tall, caudex
branching habit; leaves
peltate, lobes subequal,
white beneath; symcarps
somewhat flattened,
green; stipule purple.
The ant, though dead,
was clinging with
his mandibles.
rhizome clinging tightly
to trunks of trees and
bushes; rarely fertile.
rosette; leaves dull
green, reddish beneath.
shrub 1-1.3 m. tall,
inflorescence pendent, fruit
crimson pink.
liana; sterile.

frond fallen to ground.

erect to 1 m. or more tall,
unbranched,
fruit scarlet, fleshy.

slightly caespitose,
leaves not especially
reddish beneath.

90 m.

wine, tangled in brush.

40713 *Mimosa*

3

rare

2

19

Rutidea

in edge along roadside

1

19a

Pennisetum

abundant on roadside

Oct. 25

40 km. n. of

Abidjan

secondary thicket

around savanna

3

20

Hedyotis

common

3

21

Mussaenda aff. zing. Bm.

common

Oct. 25 - *Adiopodoume*

along lagoon

2

22

Psychotria

occasional

shrub 1 m. tall; flower
blue.liana, ~~flower~~ fruit
yellow.branched erect herb,
1 m. tall, spike dark purple

60 m.

vine tangled in bushes;
corolla tubular, tube dull
purplish, lobes
somewhat spreading.

green.

twines, climbing in top of
of small tree, corolla
bright yellow, enlarged
calyx lobes ^{green} white.shrub 1 m. tall; fruit
green to red

notes made in the herbarium
of ORSTOM, Adiopodoume

Type of *Oldenlandia pellagria*
M. Bodard, if this has been
published is the same as
Oldenlandia chevalieri Brem.

For de Bango, M. Bodard 02.4.61

2 colls. from Bance, ORSTOM
without no, probably colls.
by Gasi, 1620, 3717, none, 3762
from Attiekou, and are
in Herb. ~~ORSTOM~~ ORSTOM, in
addition to the Bodard ones.

4 species of *Carinata* in
Herb. ORSTOM -

Geophila cordiformis A. Chev.

2. *hirsuta* Benth.

9. *obovata* F. Pidr.

9. *uniflora* Hiern

send Darius book
+ F. L. Hall. To Prof. Maynard.

